# APPENDIX B
# AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

# *TASMAN EAST SPECIFIC PLAN AND EIR - AIR QUALITY AND GREENHOUSE GAS ASSESSMENT*

## *Santa Clara, California*

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## Prepared for:

**Will Burns, AICP**
Principal Project Manager
David J. Powers & Associates, Inc.
1611 Telegraph Avenue, Ste. 1002
Oakland, CA 94612

## Prepared by:

**James A. Reyff and**
**William Popenuck**

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
1 Willowbrook Court, Suite 120
Petaluma, CA 94954
(707) 794-0400

Project: 16-239

## INTRODUCTION

This report examines air quality and greenhouse gas (GHG) emissions in the Tasman East Specific Plan Area and region, includes a summary of applicable air quality and GHG regulations, and analyzes potential air quality and GHG impacts associated with the proposed Tasman East Specific Plan (TESP). The TESP would allow development of new residential units and neighborhood retail space, including a grocery store. The site is currently developed with light industrial and office uses, with surface parking lots adjacent to each property. This report includes a summary of applicable air quality and GHG regulations and analyzes potential air quality impacts and GHG emissions associated with the proposed TESP.

### Project Description

The specific plan area is an existing 46-acre industrial neighborhood, bounded by Tasman Drive to the south, the Guadalupe River to the east, the Santa Clara Golf Club to the north, and Lafayette Street to the west. The TESP area is adjacent to the Lick Mill Light Rail Transit station on Tasman Drive and the Great America Station on the west side of Lafayette Street which is served by both the Altamont Commuter Express (ACE) and Amtrak. The plan area currently includes approximately 36 parcels currently developed with light industrial and commercial uses.

The TESP area is designated in the 2015-2025 Phase of the General Plan for High Density Residential land use. Parcels in the Specific Plan area are zoned for ML – Light Industrial zoning district. The City proposes a specific plan (i.e., TESP) to create a framework for the development of a high-density transit-oriented neighborhood with supportive retail services. The TESP would allow development of up to 4,500 dwelling units, up to 106,000 square feet of retail space including a 25,000-sf grocery store, and an urban school for up to 600 students on two acres.

The TESP would maintain the existing roadway network and vehicular connections to Tasman Drive and Lafayette Street. Lick Mill Boulevard would be extended through the site to connect with the existing roadway network and City Place (current Santa Clara Golf Club) to the north. The right-of-way on Calle de Luna would be widened to accommodate sidewalks. An extension of Calle del Sol within the specific plan area, from Calle de Luna to Calle del Mundo, would also provide an additional north/south connection. Public open space within the plan area is planned for 10acres. Connections from planned open space areas and pathways to the adjacent City Place development and levee along the Guadalupe River are proposed. The plan also includes the possible culverting of the Eastside Drainage Swale on private property at the toe of the Guadalupe River levee.

## SETTING

### Air Pollutants

Ozone

Ozone ($O_3$)is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen ($NO_X$). The main sources of ROG and $NO_X$, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, shortness of breath, and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. While CO transport is limited, it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, hospital patients, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

Nitrogen Dioxide

Nitrogen dioxide ($NO_2$) is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of $NO_2$. Aside from its contribution to ozone formation, $NO_2$ also contribute to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. $NO_2$ may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. $NO_2$ decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

Sulfur dioxide ($SO_2$) is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous $SO_2$ levels in the region. $SO_2$ irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns ($PM_{10}$). $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of $PM_{10}$ and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces, and can enter the human body through the lungs.

Lead

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufactures.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the EPA and the California Air Resources Board (CARB). Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants.

High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, or schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

**Sensitive Receptors**

Some groups of people are more affected by air pollution than others. The State has identified the following categories of people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

**Regional Air Quality**

The TESP area is in the San Francisco Bay Area Air Basin. The Air Basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County.

The TESP area is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants, and the number of days during which the region exceeds air quality standards, have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

## Local Climate and Air Quality

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment.

Climate and Meteorology

During the summer, mostly clear skies result in warm daytime temperatures and cool nights in the Santa Clara Valley. Winter temperatures are mild, except for very cool but generally frost-less mornings. Further inland where the moderating effect of the bay is not as strong, temperature extremes are greater. Wind patterns are influenced by local terrain, with a northwesterly sea breeze typically developing during the daytime. Winds are usually stronger in the spring and summer. Rainfall amounts are modest, ranging from 13 inches in the lowlands to 20 inches in the hills.

Air Pollution Potential

Ozone and fine particle pollution, or $PM_{2.5}$, are the major regional air pollutants of concern in the San Francisco Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter. Most of Santa Clara County is well south of the cooler waters of the San Francisco Bay and far from the cooler marine air which usually reaches across San Mateo County in summer. Ozone frequently forms on hot summer days when the prevailing seasonal northerly winds carry ozone precursors southward across the county, causing health standards to be exceeded. Santa Clara County experiences many exceedances of the $PM_{2.5}$ standard each winter. This is due to the high population density, wood smoke, industrial and freeway traffic, and poor wintertime air circulation caused by extensive hills to the east and west that block wind flow into the region.

## Greenhouse Gases

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by humankind) atmospheric gases, such as water vapor, carbon dioxide, methane, and nitrous oxide. Gases that trap heat in the atmosphere are called greenhouse gases (GHG). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. Greenhouse gases, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the greenhouse effect. The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere, and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or global climate change. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred because it implies that there are other consequences to the global climate in addition to rising temperatures. Other than water vapor, the primary GHGs contributing to global climate change include the following gases:

- Carbon dioxide ($CO_2$), primarily a byproduct of fuel combustion;
- Nitrous oxide ($N_2O$), a byproduct of fuel combustion; also associated with agricultural operations such as the fertilization of crops;
- Methane ($CH_4$), commonly created by off-gassing from agricultural practices (e.g. livestock), wastewater treatment and landfill operations;
- Chlorofluorocarbons (CFCs) were used as refrigerants, propellants and cleaning solvents, but their production has been mostly prohibited by international treaty;
- Hydrofluorocarbons (HFCs) are now widely used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons (PFCs) and sulfur hexafluoride ($SF_6$) emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

These gases vary considerably in terms of Global Warming Potential (GWP), a term developed to compare the propensity of each GHG to trap heat in the atmosphere relative to another GHG. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time of gas remains in the atmosphere. The GWP of each GHG is measured relative to $CO_2$. Accordingly, GHG emissions are typically measured and reported in terms of equivalent $CO_2$ ($CO_2e$). For instance, $SF_6$ is 22,800 times more intense in terms of global climate change contribution than $CO_2$.

An expanding body of scientific research supports the theory that global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally-occurring resources within California could be adversely affected by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

The California Greenhouse Gas Emission Inventory – 2017 Edition (released June 6, 2017) indicates that total California emissions in 2015 were 440.4 MMT of $CO_2e$[1]. Approximately 37

[1] See https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2015/ghg_inventory_trends_00-15.pdf accessed June 8, 2017

percent of these emissions were associated with transportation (i.e., all sectors), followed by the Industrial sector at 21 percent and the Electric Power sector at 19 percent. The statewide inventory was estimated to have peaked in 2004. The current 2015 inventory is estimated to represent an overall decrease of 10 percent from 2004 levels.

## REGULATORY FRAMEWORK

Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the EPA and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants: carbon monoxide (CO), ozone ($O_3$), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are designed to protect the health and welfare of the public with a reasonable margin of safety. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each criteria pollutant.

Health effects of criteria pollutants and their potential sources are described below and summarized in Table 1.

**TABLE 1 Health Effects of Air Pollutants**

| Pollutants | Sources | Primary Effects |
|---|---|---|
| Carbon Monoxide (CO) | • Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust.<br>• Natural events, such as decomposition of organic matter. | • Reduced tolerance for exercise.<br>• Impairment of mental function.<br>• Impairment of fetal development.<br>• Death at high levels of exposure.<br>• Aggravation of some heart diseases (angina). |
| Nitrogen Dioxide ($NO_2$) | • Motor vehicle exhaust.<br>• High temperature stationary combustion. | • Aggravation of respiratory illness.<br>• Reduced visibility.<br>• Reduced plant growth. |

| | | |
|---|---|---|
| | • Atmospheric reactions. | • Formation of acid rain. |
| Ozone ($O_3$) | • Atmospheric reaction of organic gases with nitrogen oxides in sunlight. | • Aggravation of respiratory and cardiovascular diseases.<br>• Irritation of eyes.<br>• Impairment of cardiopulmonary function.<br>• Plant leaf injury. |
| Lead (Pb) | • Contaminated soil. | • Impairment of blood functions and nerve construction.<br>• Behavioral and hearing problems in children. |
| Suspended Particulate Matter ($PM_{2.5}$ and $PM_{10}$) | • Stationary combustion of solid fuels.<br>• Construction activities.<br>• Industrial processes.<br>• Atmospheric chemical reactions. | • Reduced lung function.<br>• Aggravation of the effects of gaseous pollutants.<br>• Aggravation of respiratory and cardiorespiratory diseases.<br>• Increased cough and chest discomfort.<br>• Soiling.<br>• Reduced visibility. |
| Sulfur Dioxide ($SO_2$) | • Combustion of sulfur-containing fossil fuels.<br>• Smelting of sulfur-bearing metal ores.<br>• Industrial processes. | • Aggravation of respiratory diseases (asthma, emphysema).<br>• Reduced lung function.<br>• Irritation of eyes.<br>• Reduced visibility.<br>• Plant injury.<br>• Deterioration of metals, textiles, leather, finishes, coatings, etc. |
| Toxic Air Contaminants | • Cars and trucks, especially diesels.<br>• Industrial sources such as chrome platers.<br>• Neighborhood businesses such as dry cleaners and service stations.<br>• Building materials and product. | • Cancer.<br>• Chronic eye, lung, or skin irritation.<br>• Neurological and reproductive disorders. |

Source: CARB, 2008.

## Federal Air Quality Regulations

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required EPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). Federal standards include both primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.[2] The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformity with the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in the application of sanctions on transportation funding and stationary air pollution sources in the air basin.

The 1970 FCAA authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The FCAA Amendments of 1990 changed deadlines for attaining NAAQS as well as the remedial actions required of areas of the nation that exceed the standards. Under the FCAA, State and local agencies in areas that exceed the NAAQS are required to develop SIPs to show how they will achieve the NAAQS by specific dates. The FCAA requires that projects receiving federal funds demonstrate conformity to the approved SIP and local air quality attainment plan for the region. Conformity with the SIP requirements would satisfy the FCAA requirements.

## State Air Quality Regulations

The CARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date.

[2] U.S. Environmental Protection Agency, 2013. Website: www.epa.gov/air/criteria.html. February.

The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

CARB is also responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. CARB combines this data and submits the completed SIP to the EPA.
Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

Attainment Status Designations

The CARB is required to designate areas of the State as attainment, nonattainment, or unclassified for all State standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

Table 2 shows the State and Federal standards for criteria pollutants and provides a summary of the attainment status for the San Francisco Bay Area with respect to National and State ambient air quality standards.

**TABLE 2 San Francisco Bay Area Attainment Status**

| Pollutant | Averaging Time | California Standards | | National Standards | |
|---|---|---|---|---|---|
| | | Concentration | Attainment Status | Concentration | Attainment Status |
| Carbon Monoxide (CO) | 8-Hour | 9 ppm (10 $mg/m^3$) | Attainment | 9 ppm (10 $mg/m^3$) | Attainment |
| | 1-Hour | 20 ppm (23 $mg/m^3$) | Attainment | 35 ppm (40 $mg/m^3$) | Attainment |

| | | | | | |
|---|---|---|---|---|---|
| Nitrogen Dioxide ($NO_2$) | Annual Mean | 0.030 ppm (57 mg/m$^3$) | Attainment | 0.053 ppm (100 µg/m$^3$) | Attainment |
| | 1-Hour | 0.18 ppm (338 µg/m$^3$) | Attainment | 0.100 ppm | Unclassified |
| Ozone ($O_3$) | 8-Hour | 0.07 ppm (137 µg/m$^3$) | Nonattainment | 0.070 ppm | Nonattainment |
| | 1-Hour | 0.09 ppm (180 µg/m$^3$) | Nonattainment | Not Applicable | Not Applicable |
| Suspended Particulate Matter ($PM_{10}$) | Annual Mean | 20 µg/m$^3$ | Nonattainment | Not Applicable | Not Applicable |
| | 24-Hour | 50 µg/m$^3$ | Nonattainment | 150 µg/m$^3$ | Unclassified |
| Suspended Particulate Matter ($PM_{2.5}$) | Annual Mean | 12 µg/m$^3$ | Nonattainment | 12 µg/m$^3$ | Attainment |
| | 24-Hour | Not Applicable | Not Applicable | 35 µg/m$^3$ | Nonattainment |
| Sulfur Dioxide ($SO_2$) | Annual Mean | Not Applicable | Not Applicable | 80 µg/m$^3$ (0.03 ppm) | Attainment |
| | 24-Hour | 0.04 ppm (105 µg/m$^3$) | Attainment | 365 µg/m$^3$ (0.14 ppm) | Attainment |
| | 1-Hour | 0.25 ppm (655 µg/m$^3$) | Attainment | 0.075 ppm (196 µg/m$^3$) | Attainment |

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million
mg/m$^3$ = milligrams per cubic meter
µg/m$^3$ = micrograms per cubic meter

Source: Bay Area Air Quality Management District, 2016.

California Clean Air Act

In 1988, the CCAA required that all air districts in the State endeavor to achieve and maintain CAAQS for carbon monoxide (CO), ozone ($O_3$), sulfur dioxide ($SO_2$) and nitrogen dioxide ($NO_2$) by the earliest practical date. The CCAA provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

California Air Resources Board Handbook

In 1998, CARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[3] CARB subsequently developed an Air Quality and Land

[3] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

Use Handbook[4] (Handbook) in 2005 that is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. The CARB Handbook recommends that planning agencies consider proximity to air pollution sources when considering new locations for "sensitive" land uses, such as residences, medical facilities, daycare centers, schools, and playgrounds.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook relative to the Plan Area include taking steps to consider or avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day.
- Within 300 feet of gasoline fueling stations.
- Within 300 feet of dry cleaning operations (note that dry cleaning with TACs is being phased out and will be prohibited in 2023).

**Bay Area Air Quality Management District (BAAQMD)**

The BAAQMD seeks to attain and maintain air quality conditions in the San Francisco Bay Area Air Basin (SFBAAB) through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

<u>Clean Air Plan</u>

The BAAQMD is responsible for developing a Clean Air Plan which guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD's 2017 Clean Air Plan is the latest Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and $NO_X$), particulate matter and greenhouse gas emissions. The Bay Area 2017 Clean Air Plan, which was adopted on April 19, 2017, by the BAAQMD's board of directors:

- Updates the Bay Area 2010 Clean Air Plan in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Provides a control strategy to reduce ozone, particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;

[4] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

- Reviews progress in improving air quality in recent years; and
- Continues and updates emission control measures.

BAAQMD CARE Program

The Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San Jose, Redwood City/East Palo Alto, and Eastern San Francisco.

Planning Healthy Places

BAAQMD developed a guidebook that provides air quality and public health information intended to assist local governments in addressing potential air quality issues related to exposure of sensitive receptors to exposure of emissions from local sources of air pollutants. The guidance provides tools and recommended best practices that can be implemented to reduce exposures. The information is provided as recommendations to develop policies and implementing measures in city or county General Plans, neighborhood or specific plans, land use development ordinances, or into projects.

*Odors*

Odor impacts are subjective in nature and are generally regarded as an annoyance rather than a health hazard. The ability to detect and react to odors varies considerably among people. A strong or unfamiliar odor is more easily detected and are more likely to cause complaints. BAAQMD responds to odor complaints from the public and considers a source to have a substantial number of odor complaints if the complaint history includes five or more confirmed complaints per year averaged over a 3-year period. Facilities that are regulated by CalRecycle (e.g. landfill, composting, etc.) are required to have Odor Impact Minimization Plans in place.

BAAQMD California Environmental Quality Act (CEQA) Air Quality Guidelines

The BAAQMD *CEQA Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of their *CEQA Guidelines*. In May 2011, the updated BAAQMD *CEQA Air Quality Guidelines* were amended to include a risk and hazards threshold for new receptors and modify procedures for assessing impacts related to risk and hazard impacts.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in *California Building Industry Association (CBIA) v. BAAQMD* (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, the California Supreme Court accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument considered was whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). On December 17, 2015, the California Supreme Court ruled that CEQA generally does not require an analysis of the effects of existing environmental conditions (e.g., air quality) on a project unless the project would exacerbate those conditions somehow through its construction and/or operation. In response to the legal issues, BAAQMD revised its CEQA Guidelines in May 2017.

**Local Plans and Policies**

Santa Clara General Plan

The 2010-2035 General Plan includes goals to improve air quality in the region and reduce GHG emissions. To achieve these goals, the General Plan contains the following policies:

[5] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines*. May.

5.10.2-P1 Support alternative transportation modes and efficient parking mechanisms to improve air quality.

5.10.2-P2 Encourage development patterns that reduce vehicle miles traveled and air pollution.

5.10.2-P3 Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants.

5.10.2-P4 Encourage measures to reduce greenhouse gas emissions to reach 30 percent below1990 levels by 2020.

5.10.2-P5 Promote regional air pollution prevention plans for local industry and businesses.

5.10.2-P6 Require "Best Management Practices" for construction dust abatement.

In addition, the Safety Goals of the General Plan are supported by the following policies related to air quality:

5.10.5-P34 Implement minimum setbacks of 500 feet from roadways with average daily trips of 100,000 or more and 100 feet from railroad tracks for new residential or other uses with sensitive receptors, unless a project-specific study identifies measures, such as site design, tiered landscaping, air filtration systems, and window design, to reduce exposure, demonstrating that the potential risks can be reduced to acceptable levels.

5.10.5-P35 Establish minimum buffers between odor sources and new residential or other uses with sensitive receptors, consistent with BAAQMD guidelines, unless a project-specific study demonstrates that these risks can be reduced to acceptable levels.

The General Plan includes *Prerequisite Goals and Policies* that relate to air quality. Some of these policies addressed significant impacts identified in the Draft Environmental Impact Report for the General Plan. The following policy related to air quality was included in the General Plan:

5.1.1-P24 Prior to the implementation of Phase III, the City will include a community Risk Reduction Plan ("CRRP") for acceptable Toxic Air Contaminant ("TAC") concentrations, consistent with the Bay Area Air Quality Management District ("BAAQMD") CEQA Guidelines, including risk and exposure reduction targets, measures to reduce emissions, monitoring procedures, and a public participations process.

Note that the City has not yet developed a CRRP, so health risk assessments are performed for projects that contain sensitive receptors near sources of air pollution or TACs. These include modeling of health risks for individual projects located within the minimum setbacks for roadways and railroads. Mitigation measures such as (but not limited to); site redesign, tiered plantings of trees, air filtration systems, and location of air intakes and design windows to reduce exposure, shall be required to reduce these risks to acceptable levels.

**Greenhouse Gas Regulatory Framework**

This section summarizes key federal, State, and City statutes, regulations, and policies that would apply to the TESP. Global climate change resulting from GHG emissions is an emerging environmental concern being raised and discussed at the international, national, statewide and local levels. At each level, agencies are considering strategies to control emissions of gases that contribute to global climate change.

Federal Regulations

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.

The national program for GHG emissions and fuel economy standards for light-duty vehicles (passenger cars and trucks) was developed jointly by EPA and the National Highway Traffic Safety Administration (NHTSA). The standards were established in two phases: Phase 1 - Model years 2012 - 2016 and Phase 2 - Model years 2017 - 2025. These standards are projected to result in an average industry fleetwide level of 163 grams/mile of carbon dioxide ($CO_2$) in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) (if achieved exclusively through fuel economy improvements)[6].

State Regulations

The State of California is concerned about GHG emissions and their effect on global climate change. The State recognizes that "there appears to be a close relationship between the concentration of GHGs in the atmosphere and global temperatures" and that "the evidence for climate change is overwhelming." The effects of climate change on California, in terms of how it would affect the ecosystem and economy, remain uncertain. The State has many areas of concern regarding climate change with respect to global warming. According to the 2006 Climate Action Team Report, the following climate change effects and conditions can be expected in California over the course of the next century:

[6] See U.S. EPA Regulations for Emissions from Vehicles and Engines https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-passenger-cars-and#Overview accessed 6/22/2018.

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, effecting the state's water supply;
- Increasing temperatures from 8 to 10.4 degrees Fahrenheit (°F) under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution standards are exceeded in most urban areas;
- Coastal erosion along the length of California and seawater intrusion into the Sacramento River Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions;
- Increased vulnerability of forests due to pest infestation and increased temperatures;
- Increased challenges for the state's important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and
- Increased electricity demand, particularly in the hot summer months.

*Assembly Bill 1575 (1975)*

In 1975, the Legislature created the California Energy Commission (CEC). The CEC regulates electricity production that is one of the major sources of GHGs.

*Title 24, Part 6 of the California Code of Regulations (1978)*

The Energy Efficiency Standards for Residential and Nonresidential Buildings were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

*Assembly Bill 1493 (2002)*

Assembly Bill (AB) 1493 required CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks.

*State of California Executive Order S-3-05 (2005)*

The Governor's Executive Order established aggressive emissions reductions goals: by 2010, GHG emissions must be reduced to 2000 levels; by 2020, GHG emissions must be reduced to 1990 levels; and by 2050, GHG emissions must be reduced to 80 percent below 1990 levels.

In June 2005, the Governor of California signed Executive Order S-3-05, which identified Cal/EPA as the lead coordinating State agency for establishing climate change emission reduction targets in California. A "Climate Action Team," a multi-agency group of State agencies, was set up to implement Executive Order S-3-05. Under this order, the State plans to reduce GHG emissions to 80 percent below 1990 levels by 2050. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

*Assembly Bill 32 (AB 32), California Global Warming Solutions Act (2006)*

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

*Senate Bill 375, California's Regional Transportation and Land Use Planning Efforts (2008)*

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

*Executive Order S-13-08 (2008)*

This Executive Order directed California agencies to assess and reduce the vulnerability of future construction projects to impacts associated with sea-level rise.

*SB 350 Renewable Portfolio Standards*

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

*Executive Order EO-B-30-15 (2015) and SB 32 GHG Reduction Targets*

In April 2015, Governor Brown signed this Executive Order which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed SB 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017 Climate Change Scoping Plan*. While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

The new Scoping Plan establishes a path that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State's emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings (note that new building code requirements will reduce energy use by 50% in new homes)
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit oriented housing;
- Develop walkable and bikeable communities
- Greatly increase the number of electric vehicles on the road and reduce oil demand by half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emission facilities where feasible and near-zero emissions with renewable fuels everywhere else (e.g., hybrid and zero-emission trucks); and
- Reduce "super pollutants" by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons CO2e per capita by 2030 and no more than 2 metric tons CO2e per capita by 2050. The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

Bay Area Air Quality Management District

BAAQMD is the regional government agency that regulates sources of air pollution within the nine San Francisco Bay Area counties. The BAAQMD regulates GHG emissions through the following plans, programs, and guidelines.

*Regional Clean Air Plans*

BAAQMD and other air districts prepare clean air plans in accordance with the State and Federal Clean Air Acts. The Bay Area 2010 Clean Air Plan (CAP) is a comprehensive plan to improve Bay Area air quality and protect public health through implementation of a control strategy designed to reduce emissions and ambient concentrations of harmful pollutants. The most recent CAP also includes measures designed to reduce GHG emissions.

*BAAQMD Climate Protection Program*

The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

*BAAQMD CEQA Air Quality Guidelines*

The BAAQMD adopted revised CEQA Air Quality Guidelines on June 2, 2010 and then adopted a modified version of the Guidelines in May, 2011. The BAAQMD CEQA Air Quality Guidelines include thresholds of significance for greenhouse gas emissions. Under the latest CEQA Air Quality Guidelines, a local government may prepare a qualified greenhouse gas Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified greenhouse gas Reduction Strategy, it can be presumed that the project will not have significant GHG emissions under CEQA.[7] The BAAQMD also developed a quantitative threshold for project- and plan-level analyses based on estimated GHG emissions, as well as per capita metrics.

[7] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

Santa Clara Climate Action Plan

The Santa Clara Climate Action Plan (CAP) was adopted December 3, 2013. The CAP includes measures to reduce emissions by 23.4% below 2008 levels by 2020 and a series of measures to reduce emissions beyond. The following reduction strategies would apply to this project:

- Achieve City-adopted electricity efficiency targets to reduce community-wide electricity use by 5% through incentives, pilot projects, and rebate programs.
- Incentivize and facilitate the installation of 6 MW of customer-owned residential and nonresidential solar PV projects.
- Meet the water conservation goals presented in the 2010 Urban Water Management Plan to reduce per capita water use by 2020.
- Work with regional partners to increase solid waste diversion to 80% through increased recycling efforts, curbside food waste pickup, and construction and demolition waste programs.
- Support and facilitate a community-wide transition to electric outdoor lawn and garden equipment through outreach, coordination with BAAQMD, and outdoor electrical outlet requirements for new development.
- Require construction projects to comply with BAAQMD best management practices, including alternative-fueled vehicles and equipment.
- Require new development located in the city's transportation districts to implement a TDM program to reduce drive-alone trips.
- Revise parking standards for new multi-family residential and nonresidential development to allow that a minimum of one parking space, and a recommended level of 5% of all new parking spaces, be designated for electric vehicle charging.
- Create a tree-planting standard for new development and conduct a citywide tree inventory every five years to track progress of the requirements.
- Require new parking lots to be surfaced with low-albedo materials to reduce heat gain, provided it is consistent with the Building Code.

## PROJECT IMPACTS AND MITIGATION MEASURES

### Significance Criteria

Per Appendix G of the CEQA Guidelines and BAAQMD recommendations, air quality and GHG impacts are considered significant if implementation of the TESP would:

1) Conflict with or obstruct implementation of an applicable air quality plan.
2) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality

standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

3) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
4) Expose sensitive receptors to substantial pollutant concentrations.
5) Create objectionable odors affecting a substantial number of people.
6) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
7) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The City uses the significance thresholds recommended by BAAQMD in it’s latest update to the CEQA Air Quality Guidelines. In response to the legal issues, BAAQMD revised it’s CEQA Guidelines in May 2017. The thresholds identified in Table 1 represent the most recent guidance provided by BAAQMD that are used by the City of Santa Clara. Though not necessarily a CEQA issue, the effect of existing TAC sources on future TESP receptors (residences) is analyzed to comply with BAAQMD’s Clean Air Plan key goal of reducing population TAC exposure and protecting public health in the Bay Area.

**TABLE 1. Air Quality Significance Thresholds**

| Criteria Air Pollutant | Construction Thresholds | Operational Thresholds | |
|---|---|---|---|
| | Average Daily Emissions (lbs./day) | Average Daily Emissions (lbs./day) | Annual Average Emissions (tons/year) |
| ROG | 54 | 54 | 10 |
| $NO_x$ | 54 | 54 | 10 |
| $PM_{10}$ | 82 (Exhaust) | 82 | 15 |
| $PM_{2.5}$ | 54 (Exhaust) | 54 | 10 |
| CO | Not Applicable | 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) | |
| Fugitive Dust | Construction Dust Ordinance or other Best Management Practices | Not Applicable | |
| **Health Risks and Hazards** | **Single Sources Within 1,000-foot Zone of Influence** | **Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)** | |
| Excess Cancer Risk | >10 per one million | >100 per one million | |
| Hazard Index | >1.0 | >10.0 | |
| Incremental annual $PM_{2.5}$ | >0.3 µg/m$^3$ | >0.8 µg/m$^3$ | |
| **Odors** | **Complaints** | **Complaints** | |
| | No threshold | 5 confirmed complaints per year averaged over three years | |
| **Greenhouse Gas Emissions** | | | |
| Land Use Projects – direct and indirect emissions | | Compliance with a Qualified GHG Reduction Strategy<br>OR<br>1,100 metric tons or 4.6 metric tons per capita in 2020 and 2.6 metric tons per capita in 2030 | |
| Note: ROG = reactive organic gases, NOx = nitrogen oxides, $PM_{10}$ = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. | | | |

Note that BAAQMD's recommended GHG threshold of 1,100 metric tons or 4.6 metric tons per capita was developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development within the TESP area would occur beyond 2020, so a threshold that addresses a future target is appropriate. The basis of the BAAQMD thresholds were used to develop plan level thresholds for 2040. Although BAAQMD has not yet published a quantified threshold for 2030, this assessment uses a "Substantial Progress" efficiency metric of 2.6 MT CO2e/year/service population (S.P.). This is calculated for 2030 based on the GHG reduction goals of EO B-30-15, taking into account the 1990 inventory and the projected 2030 statewide population and employment levels.[8] An efficiency metric of 1.7 MT CO2e/year/S.P. for 2040 was also calculated using the same method.

**Impact: Conflict with or obstruct implementation of an applicable air quality plan?**

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the SFBAAB. BAAQMD, with assistance from ABAG and MTC, has prepared and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[9] The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHGs.

Consistency of the TESP with Clean Air Plan control measures is demonstrated by assessing whether the proposed Plan implements the applicable Clean Air Plan control measures. The 2017 Clean Air Plan includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided into five categories that include:

- 40 measures to reduce stationary and area sources;
- 8 mobile source measures;
- 23 transportation control measures (including land use strategies);
- 4 building sector measures;
- 2 energy sector measures;
- 4 agriculture sector measures;
- 3 natural and working lands measures;
- 4 waste sector measures;
- 2 water sector measures; and
- 3 super-GHG pollutants measures.

In developing the control strategy, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to develop each measure. Implementation of each control measure will rely on some combination of the following:

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[8] Association of Environmental Professionals, 2016. *Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*. April.

[9] Bay Area Air Quality Management District (BAAQMD), 2017. *Final 2017 Clean Air Plan.*

- Adoption and enforcement of rules to reduce emissions from stationary sources, area sources, and indirect sources.
- Revisions to the BAAQMD's permitting requirements for stationary sources.
- Enforcement of CARB rules to reduce emissions from heavy-duty diesel engines.
- Allocation of grants and other funding by the Air District and/or partner agencies.
- Promotion of best policies and practices that can be implemented by local agencies through guidance documents, model ordinances, and other measures.
- Partnerships with local governments, other public agencies, the business community, non-profits, and other groups.
- Public outreach and education.
- Enhanced air quality monitoring.
- Development of land use guidance and CEQA guidelines, and Air District review and comment on Bay Area projects pursuant to CEQA.
- Leadership and advocacy.

This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. To address this impact, the TESP's effect on implementing the Clean Air Plan is evaluated based on consistency with Clean Air Planning projections (i.e., rate of increase in population versus vehicle travel) and to identify any conflicts with the Clean Air Plan control measures.

<u>Consistency with Clean Air Plan Projections</u>

The BAAQMD, with assistance from ABAG and MTC, has prepared and implemented the Clean Air Plan to meet the applicable laws, regulations, and programs. The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHG.

The TESP Plan would result in estimated additional 12,285 additional residents at build-out (4,500 dwelling units), while the General Plan only accounted for approximately 1,676 of the proposed dwelling units in its population projections. The General Plan Land Use Component and Housing Element Updates EIR Addendum (2014) also accounted for and analyzed 1,676 dwelling units within the Tasman East Focus Area or TESP area. The TESP currently includes up to 4,500 dwelling units, which leaves 2,824 dwelling units that have not been accounted for in the General Plan Addendum. The increase in housing dwelling units allowed by the TESP would be inconsistent with Clean Air Plan (2017) projections as to the number of dwelling units. As such, further analysis is necessary to identify whether the air quality impacts of the TESP are consistent with projections in the Clean Air Plan.

Daily vehicle miles traveled (VMT) for build out of the TESP area were provided by the project traffic consultant. Using the no project as a baseline condition (estimated at 21,625 miles), VMT attributable to the TESP is anticipated to increase 465 percent at build-out (100,585 miles). Assuming complete build-out of the TESP, replacing the existing uses, VMT would be 127,711 miles per day[10]. The service population is estimated at 12,600 based on a projection of 12,285 new residents and 315 new employees and school faculty. The projected VMT per capita under the TESP would be 10.1 miles. The VMT per population in the TESP would be 10.4 miles per resident.

Traffic modeling conducted for the proposed Draft 2010-2035 General Plan showed the rate of VMT growth to be less than the rate of population growth. As a result, growth under the General Plan assumptions was found to be consistent with the Clean Air Plan. The VMT was estimated at 12.2 miles per service population under General Plan build-out conditions. The TESP VMT projections of 10.1 miles per service population (10.4 miles per resident) would not exceed the General Plan VMT growth rate compared to population growth and therefore, would be consistent with the Clean Air Plan from a VMT perspective.

Consistency with Clean Air Plan Control Measures

The Guidelines set forth criteria for determining consistency with the Clean Air Plan control measures. In general, a plan is considered consistent if a) the plan supports the primary goals of the Clean Air Plan; b) includes control measures; and c) does not interfere with implementation of the Clean Air Plan measures. TESP is a considered a sustainable development since it is an infill development that would be transit-oriented and located near a mix of uses that include employment and services. As a result, these types of communities reduce the rate of per capita VMT. As a sustainable development, the TESP would generally be consistent with Clean Air Plan measures intended to reduce automobile and energy use, which are discussed below. Table 4 lists those Clean Air Plan policies relevant to the TESP and indicates consistency with the policies.

[10] Note that the traffic projections indicate 122,210 miles, but this air quality assessment conservatively includes travel associated with the school where the traffic study projections indicate these trips would be part of the projections or already existing in the network as residential trips include school trips.

**TABLE 4 BAAQMD Control Strategy Measures**

| Applicable BAAQMD Control Strategy Measures | Consistency |
|---|---|
| **Transportation Control Measures** | |
| TR1: Clean Air Teleworking Initiative | Consistent<br>The TESP would require implementation of a TDM program, which would include measures such as increased support for telecommuting |
| TR2: Trip Reduction Programs | Consistent<br>The TESP would require implementation of a TDM program, which would include measures such as transit subsidies, carpool incentives, bicycling incentives, carshare memberships, and/or vanpools. |
| TR 5: Transit Efficiency and Use | Consistent<br>While this is mostly a regionally implemented control measure, the TESP would provide connections to regional and local transit with its convenient location near the Great America train station and Lick Mill light rail transit (LRT) station. |
| TR7: Safe Routes to Schools and Safe Routes to Transit | Consistent<br>The TESP would ensure clear and safe pedestrian circulation. Convenience, safety and integrated access would be prioritized for all modes of transportation. |
| TR8: Ridesharing, Last-Mile Connection | Consistent<br>The TESP would require implementation of a TDM program, which may include measures such as carpool incentives, carshare memberships, additional Last Mile services, and/or vanpools. |
| TR9: Bicycle and Pedestrian Access and Facilities | Consistent<br>The TESP would result in a dense, walkable environment, simplify wayfinding, and ensure clear and safe pedestrian circulation. |
| TR10: Land Use Strategies | Consistent<br>The TESP would design new buildings around walkable streets and close to transit, creating opportunity for more sustainable transportation modes less reliant on the car. |
| TR13: Parking Policies | Consistent<br>The TESP would reduce demand for parking through design, transit accessibility and TDM programs. |
| **Building Control Measures** | |
| BL1: Green Buildings | Consistent<br>The TESP would meet new Title 24 standards as well as City requirements. |

| Applicable BAAQMD Control Strategy Measures | Consistency |
|---|---|
| BL2: Decarbonize Buildings | Consistent<br>The TESP would utilize energy generation through on-site photovoltaic on buildings. TESP buildings would avoid natural gas use. In addition, the TESP aims for net zero energy on-site over time as the electricity provider, Silicon Valley Power, strives to provide carbon free generated electricity to their Santa Clara customers as well as the purchase of renewable energy credits |
| BL4: Urban Heat Island Mitigation | Consistent<br>The TESP would reduce cooling load by maximizing shade through tree planting and natural foliage. |
| **Natural and Working Lands Control Measures** | |
| NW2: Urban Tree Planting | Consistent<br>The TESP would provide a comfortable, well-shaded environment defined by a consistent, linear plating plan along the streets and a variety of trees in parks and greenways. |
| **Waste Management Control Measures** | |
| WA4: Recycling and Waste Reduction | Consistent<br>The TESP would include visible recycling and composting stations in the public realm and include public awareness campaigns for all users. The TESP would provide means for waste separation at point of collection. |
| **Water Control Measures** | |
| WR2: Support Water Conservation | Consistent<br>TESP would maximize water reuse. TESP buildings would reduce water fixture use below Code minimum requirements through efficient devices and behavioral interventions. Irrigation water would rely on reclaimed water and be minimized through the use of drip systems. Dual plumbing would be installed in all buildings to use reclaimed water for toilet/urinal flushing. |

As indicated in Table 4, the TESP would include implementing policies and measures that are generally consistent with the applicable Clean Air Plan control measures.

**Impact:** **Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

The Bay Area is considered a non-attainment area for ground-level ozone and $PM_{2.5}$ under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for $PM_{10}$ under the California Clean Air Act, but not the federal act. The area has attained both state and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter (i.e., $PM_{2.5}$ and $PM_{10}$), the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NOx), $PM_{10}$, and $PM_{2.5}$ and apply to both construction period and operational period impacts for projects. They do not apply to plans, such as TESP.

Past, present and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to by itself, result in nonattainment of ambient air quality standards. Instead a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

<u>TESP Construction Emission Estimates</u>

Implementation of the Plan would result in temporary emissions from construction activities associated with subsequent development, including demolition, site grading, asphalt paving, building construction, and architectural coating. Emissions commonly associated with construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips. During construction, fugitive dust, the dominant source of $PM_{10}$ and $PM_{2.5}$ emissions, is generated when wheels or blades disturb surface materials. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. The potential health risk impact from construction is addressed in Impact 4.

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of $PM_{10}$ and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. *Mitigation Measure AQ-1 would implement BAAQMD-recommended best management practices*.

Construction exhaust emissions include those from equipment (i.e., off-road) and traffic (on-road vehicles and trucks). Off-road construction equipment is often diesel-powered and can be a substantial source of $NO_X$ emissions, in addition to $PM_{10}$ and $PM_{2.5}$ emissions. Architectural coatings and application of asphalt pavement are dominant sources of ROG emissions. The BAAQMD CEQA Air Quality Guidelines do not identify quantified plan level thresholds for construction emissions. There are project-level thresholds of 54 pounds per average day for $NO_x$, ROG and $PM_{2.5}$ exhaust and 82 pounds per average day for $PM_{10}$ exhaust. Unless controlled, the combination of temporary dust from activities and diesel exhaust from construction equipment and related traffic may pose a nuisance impact to nearby receptors or exceed acceptable levels for projects. In addition, $NO_X$ emissions during grading and soil import/export for large projects may exceed the BAAQMD $NO_X$ emission thresholds for projects.

Without application of appropriate control measures to reduce construction dust and exhaust, construction period impacts at the program level would be considered a *potentially significant impact*. *Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce this impact to a level of less than significant.*

**Mitigation Measure AQ-1: Implement BAAQMD-Recommended Measures to Control Particulate Matter Emissions during Construction for all TESP Construction Activity.** Measures to reduce NOx, ROG, diesel particulate matter and fugitive particulate matter from construction are recommended to ensure that short-term health impacts to nearby sensitive receptors are avoided.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

- Post a publicly visible sign(s) with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- The contractor shall install temporary electrical service whenever possible to avoid the need for independently powered equipment (e.g. compressors).

**Mitigation Measure AQ-2** **Require Project-Level Construction Assessment for Projects in the TESP.** Construction criteria pollutant and TAC quantification shall be required on individual projects developed under the TESP once those details are available through modeling to identify impacts and, if necessary, include measures to reduce emissions below the applicable BAAQMD construction thresholds. Reductions in emissions can be accomplished through, though is not limited to, the following measures:

- Construction equipment selection for low emissions;
- Use of alternative fuels, engine retrofits, and added exhaust devices;
- Low-VOC paints;
- Modify construction schedule; and
- Implementation of BAAQMD Basic and/or Additional Construction Mitigation Measures for control of fugitive dust.

<u>Effectiveness of Mitigation Measures AQ-1 and AQ-2</u>

Site-specific construction schedules and equipment are not known at this time for the future development area and have not been quantified at the project level. Implementation of Mitigation Measure AQ-1 would ensure that all construction projects employ the proper *BAAQMD-Recommended Measures to Control Particulate Matter Emissions* and Mitigation Measure AQ-2 would ensure that construction of future development areas under the TESP would be analyzed through project-level review to quantify construction criteria pollutant emissions and identify the specific measures needed to reduce potential impacts, as necessary. *Therefore, with implementation of Mitigation Measure AQ-1 and AQ-2, the potential impact from construction of individual development projects within the future development in the TESP area would be reduced to a level of less than significant*.

**Operational Period Emissions**

Implementation of the TESP would result in long-term area and mobile source emissions from operation and use of subsequent development. However, as described above, implementation of the TESP would contribute to an increase in planned regional growth and a large increase in VMT in the plan area. The TESP would require implementation of a TDM program which would reduce residential vehicle trips. There are no thresholds applicable to emissions associated with plan-level development; however, there are project-level thresholds. For annual emissions, these are emissions of 10 tons for ROG, NOx or $PM_{2.5}$ and 15 tons for $PM_{10}$. For average daily emissions, these are 54 pounds for ROG, NOx or $PM_{2.5}$ and 82 pounds for $PM_{10}$. Operational emissions associated with the TESP were computed to determine project-level air quality impacts.

Modeling Assumptions

Operational air emissions from the project would be generated primarily from autos driven by future residents and employees. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was used to predict net emissions from operation of the proposed project assuming 2030 full buildout.

*Land Uses*
The TESP land uses were input to CalEEMod, which included 4,500 dwelling units entered as "Apartments Mid Rise," 106,000 sf entered as "Strip Mall," and a school entered as 600 students for the land use "Elementary School." These land uses were assigned to a 41.40-acre project site, consistent with the estimated developable acreage of the Plan Area at the time the model was run. Currently, the plan area is developed and a model run was developed to account for the existing uses. Inputs included 708,000 sf entered as "General Light Industry."

*Model Year*
Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The baseline year for existing conditions was entered as 2018 and the operational year was 2030 to provide a conservative estimate for full buildout of Plan Area.

*Traffic Inputs*
CalEEMod allows the user to enter specific vehicle trip generation rates, which were input to the model using the daily trip generation rate provided in the project traffic report. The traffic study does not consider the traffic impacts from the potential school that would include 600 students with faculty, since those trips would be generated by local residential areas in or near the plan area.

Trips associated with the school were conservatively included in the CalEEMod modeling, based on the forecasted number of trips predicted that considered the proximity of the school and residences. Students that live nearby are not likely to generate new vehicle trips. Trip lengths for residential and retail uses were based on the vehicle miles travelled forecasts, that included travel distances for internal and external trips. The school trips were based on CalEEMod default conditions. The total VMT projected for each land use was divided by the number of trips generated to compute the trip length. Trip types were all set to primary trips to account for these VMT adjustments.

*Consumer Products*

CalEEMod computes emissions associated with consumer products[11] for all land uses, regardless of their types. ROG emissions from consumer products are forecasted to decrease, as shown in the CARB county emissions forecasts for 2010 through 2030. A factor to adjust the ROG consumer was developed based on the change in the per population ROG consumer emissions between 2008 and 2030. Essentially, the 2030 rate is anticipated to be 78 percent of the 2008 rate that CalEEMod uses.

*Energy*

The 2016 Title 24 Building Standards became effective January 1, 2017 and are assumed to be included in this current version of CalEEMod. Energy consumption rates for the existing uses were based on historical default conditions in CalEEMod.

*Electricity Generation*

Emissions rates associated with electricity consumption were applied to the project, using default usage rates assumed in CalEEMod. Silicon Valley Power (SVP) is the provider of electricity to the project. In 2017, SVP carbon intensity rate for electricity delivered was 429 pounds of carbon dioxide ($CO_2$) per MW of electricity provided[12]. The City's Climate Action Plan includes goals and policies to reduce GHG emission associated with SVP's electricity generation:

> *General Plan Goal:* *Eliminate coal from SVP's portfolio and increase use of natural gas and renewable energy*
>
> *Policies:* *Replace the use of coal in Silicon Valley Power's portfolio with natural gas by 2020.*

As a result, SVP's emission rate will be reduced to 380 pounds of $CO_2$ per MW in 2020. Use of this rate is considered conservative, in that other Climate Action Plan measures would be in place

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[11] Per the CalEEMod User's Guide: "Consumer products are chemically formulated products used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products"

[12] Hughes, Kathleen. Acting Division Manager for Joint Powers, Resources Division. Silicon Valley Power. Email to John Davidson (City of Santa Clara). May 31, 2018. This email reported a carbon intensity rate of 0.193 metric tons per megawatt hour of electricity delivered.

to reduce the 2020 rate. Other measures would increase the amount of renewable energy sources and increase energy efficiency to reduce emission from electricity generation.

*Other Inputs*

Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project.

Modeling Results

Table 5 reports the predicted emissions from complete build out of the TESP area in terms of annual emissions in tons and average daily operational emissions, assuming 365 days of operation per year. Net emissions between the proposed TESP area and existing uses are also shown. There are no emission thresholds that apply to potential emissions generated by a plan, such as the TESP. As shown in Table 5, average daily and annual emissions of ROG and NOx associated with operation of the plan area would exceed the BAAQMD significance thresholds for projects.

The City’s Climate Action Plan requires that the new projects implement vehicles miles travelled reductions, depending on the General Plan land use designation, project type and transportation district the project is located. For the TESP, a 10-percent target would apply to new residential developments.

**TABLE 5 Operational Period Emissions**

| Scenario | ROG | NOx | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|
| Annual Project Operational emissions (tons) | 22.17 tons | 17.29 tons | 17.03 tons | 4.88 tons |
| Existing Operational Emissions (tons) | 3.07 tons | 2.89 tons | 2.30 tons | 0.68 tons |
| Total Net Project Operational emissions (tons) | 19.10 tons | 14.40 tons | 14.73 tons | 4.20 tons |
| *BAAQMD Thresholds (tons per year)* | *10 tons project* | *10 tons project* | *15 tons project* | *10 tons project* |
| Average Daily Net Project Operational Emissions (pounds)[1] | 105 lbs. | 79 lbs. | 81 lbs. | 23 lbs. |
| *BAAQMD Thresholds (pounds per day)* | *54* lbs. *project* | *54* lbs. *project* | *82* lbs. *project* | *54* lbs. *project* |
| [1] Assumes 365-day operation. | | | | |

*Attachment 2* to this report includes the construction (schedule and equipment), and operational assumptions and CalEEMod model output files for the proposed project.

**Mitigation Measure AQ-3a:** **Implement TDM Program.** Proposed residential development within the TESP would implement TDM programs which would reduce residential vehicle miles traveled by 20 percent. The TESP would meet or exceed the anticipated Climate Action Plan reduction of 20 percent (at least half of which must come from TDM measures). However, this impact would remain significant and unavoidable given that a 20 percent reduction would not reduce significant operational ROG and NOx emissions below BAAQMD thresholds of 54 pounds per day.

**Mitigation Measure AQ-3b:** **Incorporate Green Building Measures.** Proposed development within the TESP would incorporate additional green building measures such as rooftop solar photovoltaic (PV) systems, rough-ins for electric vehicle charging, use of efficient lighting and irrigation, and recycled water, as feasible.

**Mitigation Measure AQ-3c:** **Use Low- and Super-Compliant VOC Architectural Coatings.** Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through Covenants Conditions and Restrictions (CC&Rs) and Ground Lease. Developed parcels shall require within their CC&Rs and/or ground leases requirements for all future interior spaces to be repainted only with architectural coatings that meet the "Low-VOC" or "Super-Compliant" requirements[13]. "Low-VOC" refers to paints that meet the more stringent regulatory limits in South Coast AQMD Rule 1113; however, many manufacturers have reformulated to levels well below these limits. These are referred to as "Super-Compliant" Architectural Coatings.

**Impact: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

As discussed above, implementation of the TESP would have emissions that affect ozone and particulate matter. These are considered regional air pollutant issues and are addressed by evaluating a project, or plan's, contribution to the cumulative impact. CO is a pollutant affected by localize emissions, primarily from traffic.

Monitoring data from all ambient air quality monitoring stations in the Bay Area indicate that existing carbon monoxide levels are currently below national and California ambient air quality standards. Monitored CO levels have decreased substantially since 1990 as newer vehicles with greatly improved exhaust emission control systems have replaced older vehicles. The Bay Area has been designated as an attainment area for the CO standards. The highest measured levels in the Bay Area during the past three years are 3.0 ppm or less for eight-hour averaging periods, compared with state and federal criteria of 9.0 ppm.

Even though current CO levels in the Bay Area are well below ambient air quality standards, and there have been no exceedances of CO standards in the Bay Area since 1991, elevated levels of CO still warrant analysis. CO hotspots (occurrences of localized high CO concentrations) could still occur near busy congested intersections. Recognizing the relatively low CO concentrations experienced in the Bay Area, the BAAQMD's CEQA Air Quality Guidelines state that a project would have a less-than-significant impact if it would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. Peak hour traffic volumes at intersections affected by implementation of the TESP area would be less than 15,000 per hour. Therefore, this impact would be less than significant.

**Impact: Expose project sensitive receptors to substantial pollutant concentrations during operation?**

[13] South Coast Air Quality Management District (South Coast AQMD) provides a list of Low and Super-Compliant VOC paint manufacturers. See http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings

As discussed above, in December 2015, the Supreme Court determined that an analysis of the impacts of the environment on a project – known as “CEQA-in-reverse” – is only required under two limited circumstances: (1) when a statute provides an express legislative directive to consider such impacts; and (2) when a proposed project risks exacerbating environmental hazards or conditions that already exist (Cal. Supreme Court Case No. S213478). However, the Clean Air Plan contains the following goal: “reduce population exposure and protecting public health in the Bay Area.” Therefore, the potential community risk impact to future onsite receptors is addressed here.

To address exposure of sensitive receptors to substantial pollutant levels, the BAAQMD CEQA Guidelines developed thresholds that address community health risk. These include increased cancer risk, non-cancer hazards and increased annual concentrations of $PM_{2.5}$. Sources of TACs and $PM_{2.5}$ lead to increased community risk levels. Diesel particulate matter, or DPM, is the predominant TAC in the area.

BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs. Nearby stationary sources of TACs (e.g., emergency back-up generators and gas stations) and traffic on local roadways could affect the proposed residences. There is a rail line along the western boundary of the project. Implementation of the proposed project is not expected to introduce any new stationary sources of operational TACs. Figure 1 shows the TESP area, the 1,000-foot influence area and the nearby stationary sources. Busy nearby roadways include Lafayette Street, Tasman Boulevard and Lick Mill Boulevard. There is a rail line and the Great America train station near the site that is a source of TAC emissions from diesel-powered locomotives. Light rail transit trains operating on Lick Mill Boulevard are electrified and, therefore, not a source of DPM.

**Figure 1  TESP Area and 1,000-foot Influence Area with Identified Stationary Sources**


Note: See Table 7. BAAQMD Plants 2527 (Nu-Metal Finishing), 1636 (Alzerta Corporation), 1642 (Megastar), and 11297 (Shibauru Technology International Corp) pose very low or no risk. Plant 5323 (Coatek) has been closed.

## Community Risk Impact Evaluation Methodology

A health risk assessment for exposure to TACs requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[14] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[15] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current BAAQMD guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. BAAQMD is in the process of developing new guidance

[14] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[15] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

and has provided initial information on exposure parameter values they are proposing for use.[16] In order to be conservative, the OEHHA guidelines and newly recommended BAAQMD exposure parameters were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR \times A \times (EF/365) \times 10^{-6}$

Where:

[16] Email from Virginia Lau, BAAQMD to Bill Popenuck of Illingworth & Rodkin, Inc, dated November 15, 2015.

$C_{air}$ = concentration in air (μg/m$^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
$10^{-6}$ = Conversion factor

The health risk parameters used in this evaluation are summarized in Table 6.

**TABLE 6 Community Risk Parameters Used for Cancer Risk Calculations**

| Parameter | *Exposure Type* | Infant | | Child | Adult |
|---|---|---|---|---|---|
| | *Age Range* | 3rd Trimester | 0<2 | 2 < 16 | 16 - 30 |
| DPM Cancer Potency Factor (mg/kg-day)$^{-1}$ | | 1.10E+00 | 1.10E+00 | 1.10E+00 | 1.10E+00 |
| Daily Breathing Rate (L/kg-day)* | | 361 | 1,090 | 572 | 261 |
| Inhalation Absorption Factor | | 1 | 1 | 1 | 1 |
| Averaging Time (years) | | 70 | 70 | 70 | 70 |
| Exposure Duration (years) | | 0.25 | 2 | 14 | 14 |
| Exposure Frequency (days/year) | | 350 | 350 | 350 | 350 |
| Age Sensitivity Factor | | 10 | 10 | 3 | 1 |
| Fraction of Time at Home | | 1.0 | 1.0 | 1.0 | 0.73 |

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for projects involving construction or for residential projects locating near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter or DPM. For DPM, the chronic inhalation REL is 5 μg/m$^3$.

$PM_{2.5}$ Concentrations

While not a TAC, $PM_{2.5}$ has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under CEQA. The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects involving construction, $PM_{2.5}$ impacts should include those from construction equipment and vehicle exhaust in addition to fugitive dust impacts from construction activities. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

**Effects on TESP Sensitive Receptors**

The project would include new sensitive receptors. Substantial sources of air pollution can adversely affect sensitive receptors proposed as part of new projects. A review of the area indicates there are local roadways, a rail line with diesel locomotives and stationary sources within 1,000 feet of the plan area that can adversely affect new residences. Table 7 summarizes the maximum risk from any source and the maximum cumulative risks. The contribution from each source is discussed below.

**TABLE 7 Maximum Community Risk Levels at TESP Area**

| Source | Lifetime Cancer Risk (per million) | Annual $PM_{2.5}$ ($\mu g/m^3$) | Acute or Chronic Hazard Index |
|---|---|---|---|
| Lafayette Street at 25 feet | **15.6** | **0.54** | 0.01 |
| Tasman Drive at 25 feet | **14.4** | **0.42** | 0.01 |
| Lick Mill Boulevard at 150 feet | 2.4 | 0.07 | 0.00 |
| City of Santa Clara Plant 17251 at 500 feet | 7.2 | 0.01 | 0.01 |
| Alzerta Corporation Plant 1636 (on site) | 0.0 | 0.04 | 0.00 |
| Italix Company Plant 3037 (on site) | 0.0 | 0.07 | 0.01 |
| Megastar Plant 1642 (on site) | 0.00 | 0.01 | 0.00 |
| UPRR Rail Line Great America Station at 110 feet | **22.0** | 0.03 | <0.01 |
| Total | <61.6[a] | **1.19** [a] | <0.03 [a] |
| *Single-Source Threshold* | *>10.0* | *>0.3* | *>1.0* |
| *Cumulative Source Threshold* | *>100.0* | *>0.8* | *>10.0* |
| *Exceed Threshold?* | Single: *Yes*<br>Cumulative: No | *Yes*<br>*Yes* | No<br>No |

Note:

1. Bold values indicate values above threshold.
2. Plant 5323 (Coatek) has been closed

3. The actual cumulative level would be less because this value represents the sum of the maximum impacts even though the maximum from each source does not occur at any one location.

Roadway Impacts

For local roadways, BAAQMD has provided a screening calculator to determine if roadways with traffic volumes of over 10,000 vehicles per day may have a significant effect on a proposed project. Three local roadways appear to affect the project site: Lafayette Street, Tasman Drive and Lick Mill Boulevard. Inputs to the screening calculator include county, roadway orientation, side of the roadway the receptor is located, distance from the edge of the roadway, and the average daily traffic volume or ADT.

Two adjustments were made to the cancer risk predictions made by this calculator: (1) adjustment for latest vehicle emissions rates and (2) adjustment of cancer risk to reflect new OEHHA guidance described above. The calculator uses EMFAC2011 emission rates for the year 2014. Overall, emission rates will decrease by the time the project is constructed and occupied. The project is not likely to be occupied prior to 2018. In addition, a new version of the emissions factor model, EMFAC2014 is available. This version predicts lower emission rates. An adjustment factor of 0.5 was developed by comparing emission rates of total organic gases (TOG) for vehicle running exhaust (i.e., tailpipe exhaust) and evaporative ROG running losses developed using EMFAC2011 for year 2014 and those from EMFAC2014 for year 2018[17]. The predicted cancer risk was then adjusted using a factor of 1.3744 to account for new OEHHA guidance. This factor was provided by BAAQMD for use with their CEQA screening tools that are used to predict cancer risk[18].

Traffic volumes were based on the project traffic impact assessment, using the average of the am and pm peak-hour volume and multiplying by ten to get the average daily traffic trips (ADT)[19]. The following inputs were used to model nearby roadways using the BAAQMD *Roadway Screening Analysis Calculator* for Santa Clara County:

- Lafayette Street was modeled as a north-south roadway west of the project site with a range of distances from the east side of the roadway edge. The ADT was computed at about 30,000 vehicles per day.
- Tasman Drive was modeled as a east-west roadway west of the project site with a range of distances from the east side of the roadway edge. The ADT was computed at about 45,000 vehicles per day.

[17] EMFAC2014 produces emission rates for 2018 that are 54 percent less for exhaust $PM_{2.5}$ and 44 percent less for total organic gases than EMFAC2011 produces for the year 2014.
[18] Email from Virginia Lau, BAAQMD to Bill Popenuck of Illingworth & Rodkin, Inc, dated November 15, 2015.
[19] Fehr & Peers. 2018. *Tasman East Specific Plan Administrative Draft Transportation Impact Assessment*. January. See Figures 4-2 and 5-1.

- Lick Mill Boulevard was modeled as a north-south roadway east and south of the project site with a range of distances from the east side of the roadway edge. The ADT was computed at about 15,500 vehicles per day.

Potential cancer risk, annual $PM_{2.5}$ concentrations and non-cancer hazard HI from these roadways would be below the BAAQMD significance thresholds for community risk from single sources.

Stationary Source TAC Impacts

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Screening Analysis Tool*. This mapping tool uses Google Earth to identify the locations of stationary sources and their estimated risk and hazard impacts[20]. BAAQMD Plants 2527 (Nu-Metal Finishing) and 11297 (Shibauru Technology International Corp) pose very low or no risk. Plant 5323 (Coatek) has been closed. Note that Plants 1636 (Alzeta Corporation), 3037 (Italix Company Incorporated) and 1642 (Megastar) are on the site and would likely be removed as part of the TESP implementation and, therefore, would no longer pose any risk to the project site. In any case, these plants were not found to present adverse risk impacts. The BAAQMD tool identified the following on- and off-site sources that could affect the plan area:

- Plant 1636 (Alzeta Corporation) is an unidentified source located at 2343 Calle Del Mundo within the plan area. The plant is a source of $PM_{2.5}$ emissions with screening levels, per the BAAQMD screening data, below the single-source thresholds (i.e., cancer risk greater than 10 chances per million, hazard index greater than 1.0 and annual $PM_{2.5}$ concentration of $0.3 \mu g/m^3$).
- Plant 3037 (Italix Company Incorporated) is an unidentified source located at 2232 Calle Del Mundo within the plan area. The plant is a source of TAC and $PM_{2.5}$ emissions with screening levels, per BAAQMD screening data, below the single-source thresholds.
- Plant 17251 (City of Santa Clara) is an emergency back-up generator located at 2501 Stars and Stripes, about 500 feet west of the plan area. At BAAQMD's recommendation, risk and $PM_{2.5}$ concentrations from the diesel generator were adjusted based on BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion (IC) Engines*. According to the BAAQMD screening data (and adjusted for the 500-foot distance), this facility would result in risk levels below thresholds of significance.

**Railroad Community Risk Impacts**

The TESP site is located a near rail line used for freight and passenger rail service. The southeastern portion of the project along Lafayette Street is across from the Great America train station with the nearest rail line about 100 feet from the project site boundary. Trains traveling on the rail line generate TAC and $PM_{2.5}$ emissions from diesel locomotives. Due to the proximity of

[20] See http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools, accessed January 29, 2015.

the rail line to the proposed project, potential community risks to future project residents from DPM emissions from diesel locomotive engines were evaluated.

Altamont Commuter Express (ACE), Amtrak's Capitol Corridor and Coast Starlight passenger trains use this rail line. Based on current Amtrak schedules, the Amtrak Capitol Corridor, which provides service between Sacramento/Auburn and San Jose, has 18 weekday trains and 15 weekend trains on these rail lines. The Amtrak Coast Starlight operates between Seattle and Los Angeles, with 2 daily trains. The ACE operates 8 trains daily between Stockton and San Jose. In addition to the passenger trains, there are about 2 freight trains that use the rail lines on a daily basis.[21] All trains are assumed to use diesel-powered locomotives.

DPM and $PM_{2.5}$ emissions from trains on the rail line were calculated using EPA emission factors for locomotives[22] and CARB adjustment factors to account for fuels used in California.[23] For passenger trains it was assumed that these trains use one 3,200 hp diesel locomotives and would continue to do so in the future. Emissions from freight trains were calculated assuming they would use two locomotives with 2,300 hp engines (total of 4,600 hp). Passenger and freight trains that would not stop at the Great America Station were assumed to be traveling at an average speed of 40 mph in the vicinity of the project site. Passenger trains stopping at the Great America Station were assumed to be traveling at 30 mph when approaching and departing the station and an average speed of 10 mph in the vicinity of the station.

Emissions of DPM (PM exhaust from diesel locomotives) were developed for the year 2020. Year 2020 was assumed to be the first year of any project occupancy (noting that full build out would likely occur in 2030 or later) and emissions for 2020 were conservatively assumed to be representative of future conditions over the 30-year period that cancer risks are evaluated (2020-2049). DPM emissions from diesel-fueled locomotives will be reduced over time due to regulatory requirements for reduced particulate matter emissions from diesel locomotives. As such, use of DPM emissions for 2020 is a conservative estimate of emissions over the entire 30 year exposure period.

Modeling of locomotive emissions was conducted using the EPA's AERMOD dispersion model and with a 5-year set (2006-2010) hourly meteorological data from the San Jose Airport prepared by the BAAQMD for use with the AERMOD model. Locomotive emissions from train travel within about 1,000 feet of the project site were modeled as line sources comprised of a series of adjacent volume sources with a release height of 5 meters (16 feet) along the centerline of the rail line near the project site. Concentrations were calculated at receptor locations spaced every 15 meters (49 feet) within the proposed project area. Receptor heights of 1.5 meters (5 feet) and 4.5

[21] U.S. Department of Transportation, Federal Railroad Administration, U.S. DOT Crossing Inventory Form for DOT Crossing Inventory Number 749963T, accessed January 22, 2018.

[22] U.S. EPA, 2009. *Emission Factors for Locomotives* (EPA-420-F-09-025).

[23] CARB*, 2006. Offroad Modeling, Change Technical Memo, Changes to the Locomotive Inventory*. July.

meters (15 feet), representative of breathing heights on the first and second floor residential levels, were used in the modeling. Figure 2 shows the railroad line segments used for the modeling and receptor locations at the project site where concentrations were calculated. The maximum modeled DPM and $PM_{2.5}$ concentrations occurred near the northwest corner of the project site on the first floor level. The location where the maximum modeled long-term on-site DPM and $PM_{2.5}$ concentrations occurred is also shown in Figure 2.

Maximum excess cancer risks at each project site were calculated from the maximum modeled long-term average DPM concentrations using methods recommended by BAAQMD[24]. Details of the emission calculations, dispersion modeling and cancer risk calculations are contained in Attachment 2.

The maximum increased cancer risk at the TESP site was computed as 22.0 in one million for ground-level (first-floor level) exposures. This level exceeds the single-source cancer risk threshold. The location of maximum cancer risk is shown in Figure 2. Increased cancer risks at residences on floor levels above the first floor and at farther distances from the rail line would be less than the maximum cancer risk on the first-floor level. Based on the rail line modeling, the maximum $PM_{2.5}$ concentration at the project site was 0.0272 $\mu g/m^3$, occurring at the same receptor that had the maximum cancer risk. Potential non-cancer health effects due to chronic exposure to DPM were expressed in terms of a hazard index (HI), as previously described. The maximum predicted annual DPM concentration from locomotives is 0.0296 $\mu g/m^3$. This concentration is much lower than the REL. Thus, the Hazard Index would be less than 0.01.

Summary of Single-Source Community Risk

Table 7 shows the contribution of risk from each source affecting the TESP area. Three sources of TAC and $PM_{2.5}$ emissions were found to cause significant exposures across the site: the Union Pacific Railroad rail line, Lafayette Street and Tasman Drive. Figure 3 shows the areas affected by these sources, which include the western portion of the site that is within 270 feet of the rail line and the southern portion that is within 110 feet of the Tasman Drive edge of travel lane (this area encompasses the 100 feet of area along the western side of the TESP that is affected by Lafayette Street). Any development of sensitive receptors within these affected areas would expose sensitive receptors to significant exposure of cancer risk and/or $PM_{2.5}$ concentrations. This would be a potentially *significant impact.*

Cumulative Community Risk

As discussed above, the project site is affected by multiple sources of TACs. Table 7 shows the maximum community risks associated with each source affecting the plan area. The sum of

[24] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. January 2016.

impacts from combined sources (i.e., sources within 1,000 feet of the project) would be above the BAAQMD threshold of significance for $PM_{2.5}$. The cumulative cancer risk would be below the thresholds. This would be a potentially *significant impact. Implementation of Mitigation Measure AQ-3 would reduce cumulative annual $PM_{2.5}$ concentration within the Plan area to 0.8 µg/m³* or less.

**Mitigation Measure AQ-3 The project shall implement appropriate measures to minimize long-term toxic air contaminant (TAC) and annual $PM_{2.5}$ exposure for new project occupants:**

Either include measures to reduce long-term exposure to TAC and $PM_{2.5}$, as described below, or conduct site-specific analysis of proposed projects in the TESP area that are within 270 feet of the UP Railroad or 110 feet of Tasman Lane to identify the level of exposure to TACs in terms of cancer risk and annual $PM_{2.5}$ concentrations. The analysis shall use procedures prescribed by BAAQMD (e.g., the BAAQMD CEQA Air Quality Guidelines) to predict these exposures. Where cancer risk exceeds 10 chances per million from any single source or annual $PM_{2.5}$ concentrations exceed 0.3 $\mu g/m^3$ or 0.8 $\mu g/m^3$ (see Figure 3), the following measures shall be implemented:

a. Design project developments to limit exposure from sources of TACs and fine particulate matter ($PM_{2.5}$) emissions. The final site layout shall locate operable windows and air intakes as far as possible from the Union Pacific rail road line/Lafayette Street and Tasman Drive.
b. To the greatest degree possible, plant vegetation along the project site boundaries with Union Pacific rail road line/Lafayette Street and Tasman Drive and around outdoor use areas. This barrier would include trees and shrubs that provide a dense vegetative barrier.
c. Install air filtration at units that have predicted $PM_{2.5}$ concentrations above 0.3 micrograms per cubic meter ($\mu g/m^3$). Air filtration devices shall be rated MERV13 or higher. Alternately, at the approval of the City, equivalent control technology may be used if it is shown by a qualified air quality consultant or heating, ventilation, and air conditioning (HVAC) engineer that it would reduce risk below significance thresholds.
d. As part of implementing this measure, an ongoing maintenance plan for the building's HVAC air filtration system shall be required.
e. Ensure that any lease agreements and other property documents (1) require cleaning, maintenance, and monitoring of the affected units for air flow leaks; (2) include assurance that new owners and tenants are provided information on the ventilation system; and (3) include provisions that fees associated with owning or leasing a unit(s) in the building include funds for cleaning, maintenance, monitoring, and replacements of the filters, as needed.
f. Require that, prior to building occupancy, an authorized air pollutant consultant or HVAC engineer verify the installation of all necessary measures to reduce cancer risk below 10 chances per million from any source and $PM_{2.5}$ concentrations below 0.3 $\mu g/m^3$ for any source and 0.8 $\mu g/m^3$ for all sources.

**Figure 2 TESP Site and On-site Residential Receptors, Rail Line Segment Evaluated, and Location of Maximum TAC Impacts**

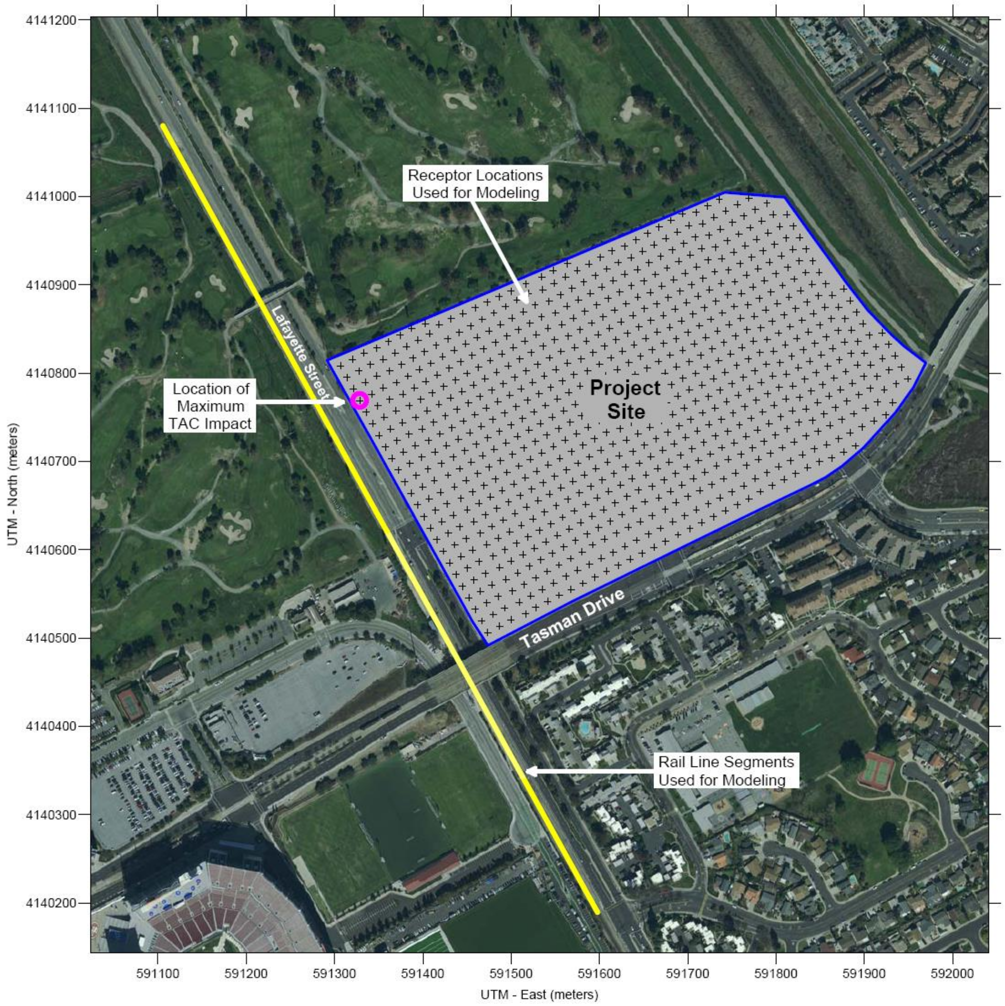
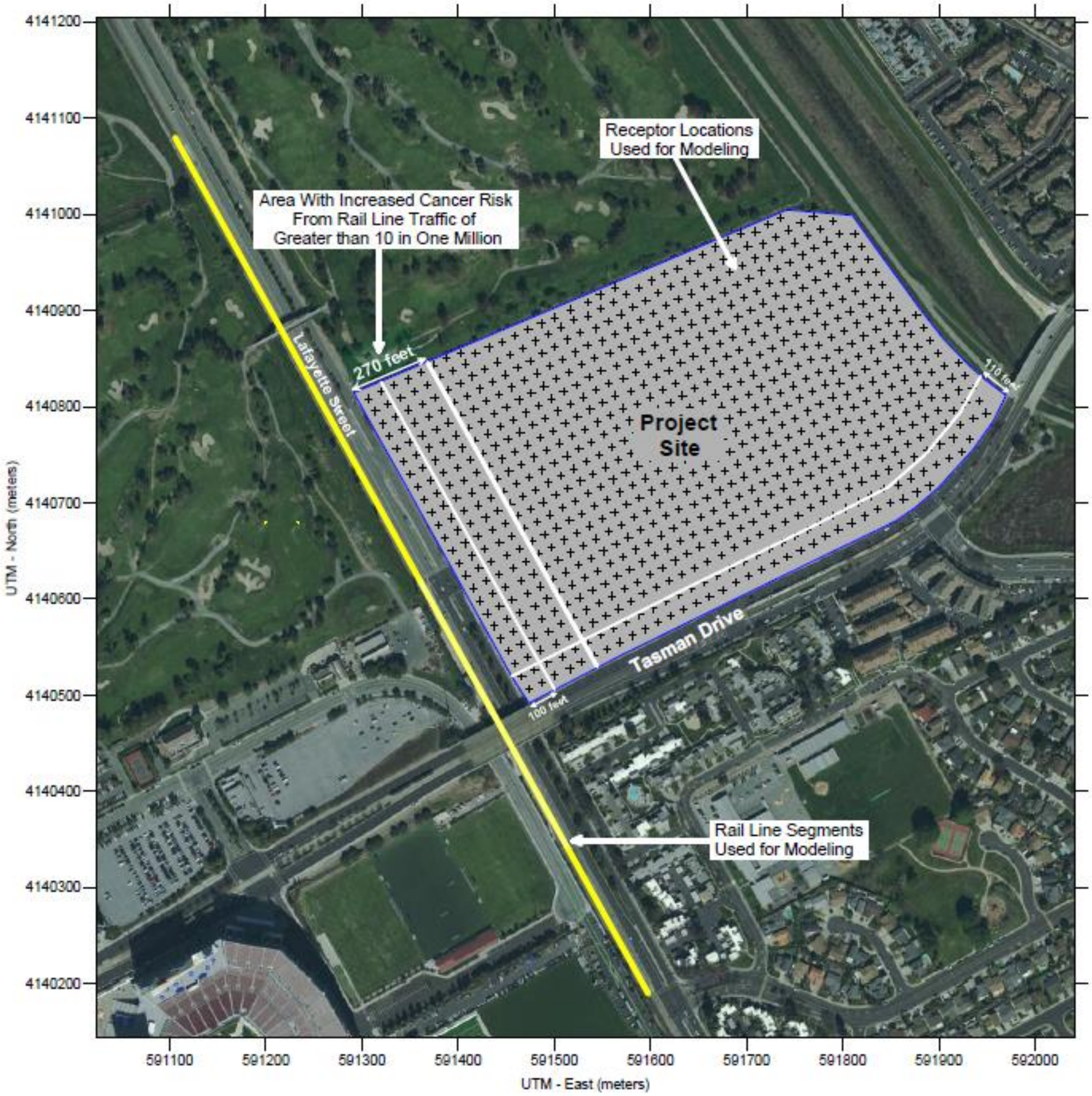


**Figure 3 TESP Area Affected by Sources of Air Pollution and TACs**




Effectiveness of Mitigation Measure AQ-3

The BAAQMD CEQA Air Quality Guidelines and BAAQMD's Planning Healthy Places recommend that developments in areas affected by air pollutant sources install and maintain air filtration systems of fresh air supply. These systems should be installed on either an individual unit-by-unit basis, with individual air intake and exhaust ducts ventilating each unit separately, or through a centralized building ventilation system. The ventilation system should be certified to achieve certain effectiveness.

The air filtration recommendations identified for Mitigation Measure AQ-3, filtration system using MERV13, was evaluated for effectiveness. Increased cancer risks for each of the filtration cases were calculated assuming a combination of outdoor and indoor exposure. This includes 3 hours of outdoor exposure to ambient DPM concentrations and 21 hours of indoor exposure to filtered air was assumed. In this case, the effective particulate control efficiency using a MERV13 filtration system is about 85 percent and 70 percent when accounting for 3 hours of non-filtered air.

Assuming the effectiveness of filtration systems described above, implementation of Mitigation Measure AQ-3 would reduce maximum cancer risk to about 7 chances per million and cumulative annual $PM_{2.5}$ concentrations to 0.3 μg/m$^3$ or less. Cancer risk from any single source would be reduced to less than 10 chances per million and cumulative $PM_{2.5}$ concentrations from all sources within 1,000 feet would be reduced to 0.8 μg/m$^3$ or less. Therefore, with implementation of Mitigation Measure AQ-3, this impact would be reduced to a of less-than-significant level.

**Project Construction**

Subsequent land use activities associated with implementation of the TESP could potentially include short-term construction sources of TACs. There are sensitive receptors about 150 feet south of the plan area (across Tasman Drive) and there will be future residents in the TESP development areas that could potentially be exposed to construction TACs during construction activity.

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. The construction exhaust emissions may pose community risks for sensitive receptors such as nearby residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A community risk assessment of the project construction activities would have to be conducted at a project level to address these impacts. Since specific construction plans and schedules for construction are not known, it is not possible to quantify the impacts and determine the significance. There are various measures that can be incorporated into construction plans that could minimize these potential impacts.

Because residential development at the project site would be developed over time there would be on-site residences (new sensitive receptors) occupied while construction would be occurring in other areas of the plan area. Community health risks to nearby off-site and future on-site sensitive receptors associated with temporary construction of the future development is considered *potentially significant*. *Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce this impact to less than significant.*

Effectiveness of Mitigation Measures AQ-1 and AQ-2

Implementation of *Mitigation Measure AQ-1* is considered to reduce exhaust emissions by 5 percent and fugitive dust emissions by over 50 percent. Implementation of the Additional Measures identified in *Mitigation Measure AQ-2* through future project-specific assessments would further reduce on-site diesel exhaust emissions. The selection of appropriate equipment could reduce emissions substantially. For example, the use of diesel-powered construction equipment that meets U.S. EPA particulate matter emissions standards for Tier 4 engines or included diesel particulate matter filters certified by CARB can reduce diesel particulate matter emissions by at least 80 percent. That measure alone would likely reduce construction health risk impacts to a less than significant level. Other measures identified in Mitigation Measure AQ-2 would further reduce impacts. Additional measures to reduce TAC and $PM_{2.5}$ emissions would include hourly limits for generator or crane use, electrification or use of alternative fuels for portable equipment, appropriate staging of equipment, and additional limitations on equipment idling. The application of appropriate measures would reduce construction cancer risk below 10 chances per million and the increases to $PM_{2.5}$ concentrations to below 0.3 $\mu g/m^3$. Therefore, *after implementation of these recommended measures, the project would have a less-than-significant impact with respect to community risk caused by construction activities.*

**Project Operational**

Sources of TACs or $PM_{2.5}$ emissions associated with the project have not been identified. The types of land uses envisioned under the TESP are not anticipated to include these sources such that significant exposures could occur. These uses may include diesel generator or natural gas-fueled boilers that would require permitting by BAAQMD. These types of sources of air pollution that operate within accordance of BAAQMD rules and regulations would not cause significant exposure for on- or off-site sensitive receptors. This would be a *less-than-significant impact*.

**Impact: Create objectionable odors affecting a substantial number of people?**

The project would generate localized emissions of diesel exhaust during construction equipment operation and truck activity. These emissions may be noticeable from time to time by adjacent receptors. However, they would be localized and are not likely to adversely affect people off site by resulting in confirmed odor complaints. The TESP plan does not identify any typical sources of odors that could lead to objectionable odors that generate frequent odor complaints.

Odor impacts could occur if residents associated with the project experienced objectionable odors and made complaints. Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative methodologies to determine the presence of a significant odor impact. The significance of odor impacts is based on the potential to cause odor complaints.

BAAQMD publishes screening buffer distances for odor sources and sensitive receptors in their CEQA Air Quality Guidelines. There is a wastewater treatment plant and a materials recovery resource facility within these screening distances of 2 miles. The San Jose-Santa Clara Regional Wastewater lies 1.4 to 1.8 miles northeast of the TESP. Zero Waste Energy Development Company's facility on Zanker Road lies about 1.6 to 2 miles away in the same direction. Both facilities have been identified to have been identified to have odor complaints by BAAQMD; however, most complaints occur in Milpitas that lies to the east-southeast of these facilities.

Wind flow in the area is described using a wind rose with representative historical meteorological data. Figure 4 shows the wind rose that was developed using a 5-year meteorological data set (2006-2010) from the San Jose Airport prepared for use with the AERMOD model by the BAAQMD. The "petals" of the wind rose indicate the direction of wind flow (i.e., where it flows from) and the longer the petal, the more frequent the wind flows from that direction.

As shown in Figure 4, the dominant wind flow is from the north-northwest, so typically, the project site is not downwind of these sources. Wind flow from a direction that could advect odors toward the project site would occur less than 5 percent of the time or less. Odors generated

**Figure 4 Wind Rose for San Jose International Airport Illustrating Wind Flow in the Area Near TESP**


**Wind Rose from BAAQMD Station #7902 for years 1992-95 and 1997.**

**Impact:** **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

The City of Santa Clara Climate Action Plan[25] serves as a Qualified Greenhouse Gas Reduction Strategy or a community-wide plan approved by BAAQMD to reduce greenhouse gas (GHG) emissions in accordance with AB 32 goals. A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

The City's Climate Action Plan (or CAP) identifies how the City will achieve the state-recommended GHG emissions reduction target of 15% below 2008 levels by the year 2020. While the plan would continue to reduce GHG emissions beyond 2020, it does not address the new GHG emission targets for 2030. Therefore, GHG emissions associated with the TESP development were modeled for 2030 and compared against the computed per service population threshold of 2.6 metric tons per service population per year.

The CalEEMod model that was used to predict air pollutant emissions was used to compute annual GHG emissions in 2030. The annual GHG emissions for 2030 from build-out of the TESP were divided by the service population of 12,600 new residents and workers to compute per service population emissions. The CalEEMod modeling accounted for aspects of the TESP that would reduce traffic trip rates and travel lengths, including proximity to transit and employment centers.

As shown in Table 8, 2030 full build-out operation of the Proposed Project would have annual service population emissions of 1.2MT of $CO_2e$/yr/S.P. in 2030, which would not exceed the 2030 Substantial Progress threshold of 2.6 MT of $CO_2e$/year/S.P. Emissions are anticipated to be less in 2040 as motor vehicle emissions decrease and emissions from energy uses are anticipated to decrease also. Full build-out conditions in 2030 indicate that emissions would be below the 2040 threshold, so it is anticipated that the project would have emissions below the 2040 thresholds also. The emissions of GHG associated with the TESP would be *less than significant*.

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[25] City of Santa Clara, 2013. *Santa Clara Climate Action Plan*. December.

**TABLE 8 GHG Emissions (MT of $CO_2e$)**

| Source Category | Existing Uses in 2018 | Existing Uses in 2030 | TESP Build Out in 2030 |
|---|---|---|---|
| Area | <1 | <1 | 237 |
| Energy Consumption | 2,776 | 2,270 | 5,617 |
| Mobile | 2,490[1] | 1,788[1] | 13,544[1] |
| Solid Waste Generation | 442 | 442 | 1,152 |
| Water Usage | 321 | 254 | 587 |
| **Total** | 6,028 | 4,754 | 21,137 |
| **Net Increase in 2030** | | | 15,109 |
| **Efficiency Metric** | 25.5[2] | 20.1[2] | 1.2[3] |
| ***2030 Substantial Progress Threshold*** | | | 2.6 MT CO2e/year/SP |

Notes: [1]Includes plan area specific VMT. [2]Based on an estimated 2.5 workers per 1,000 sf of retail and 50 school employees. [3]Based on SP of 12,600
SP = service population

**Impact 7: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. The project would comply with requirements of the Green Building Code. For example, proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures and water-efficient irrigation systems.

According to the City Climate Action Plan, the Santa Clara community emitted approximately 2,037,800 metric tons of carbon dioxide equivalent (MT $CO_2e$) in the year 2008. Of that, 54 percent came from non-residential energy, 26 percent came from transportation, 9 percent came from community point sources, 8 percent came from residential energy, 2 percent came from off-road equipment, 1 percent came from waste, and less than one percent each came from rail transit, water and wastewater energy, and direct wastewater.

One purpose of the Qualified Greenhouse Gas Reduction Strategy is to streamline the decision-making process regarding a proposed project's impact on GHG emissions within the City. Thus, the project's consistency with relevant Climate Action Plan measures and actions has been used to evaluate the significance of this impact.

The following emissions reduction measures and actions shown in Table 9 are relevant to the proposed project, with the project's consistency evaluated below.

**TABLE 9 Climate Action Plan Consistency**

| Applicable Climate Action Plan Measures | Consistency |
|---|---|
| **Focus Area 2: Energy Efficiency Programs** | |
| Measure 2.4: Customer-Installed Solar | Consistent<br>While this measure is implemented by the City, there are plans for TESP to incorporate photovoltaic solar panels. Developers would also be encouraged to incorporate solar power, to the degree feasible, and at minimum provide solar ready infrastructure. |
| **Focus Area 3: Water Conservation** | |
| Measure 3.1: Urban Water Management Plan Targets | Consistent<br>The TESP would include measures to choose hardscape materials that will reduce storm water runoff volume, rate, and pollutants, and direct all storm water runoff from hardscapes towards landscaped areas. TESP development would install and utilize recycled water irrigation and water saving technology, whenever possible. The TESP would also include measures to introduce natural, drought tolerant landscape systems that minimize water inputs by selecting plants suited to the site's soil and climate conditions to minimize water use and use of drip irrigation. |
| **Focus Area 4: Waste Reduction** | |
| Measure 4.2: Increased Waste Diversion | Consistent<br>The TESP would include measures to employ best practices in resource efficiency and conservation by using durable, sustainably harvested, re-use, and/or recycled materials. Development under the TESP would participate in the City's Construction and Demolition Debris Recycling Program, which requires the recycling or diversion of at least 50 percent of construction debris generated by the project. |
| **Focus Area 5: Off-Road Equipment** | |
| Measure 5.1: Lawn and Garden Equipment | Consistent<br>As new development, the project will be equipped with the outdoor electrical outlets necessary to accommodate electric outdoor lawn and garden equipment. The TESP project applicants will cooperate with the City and BAAQMD's efforts to encourage the use of electric outdoor equipment. |
| Measure 5.2: Alternative Construction Fuels | Consistent |

| Applicable Climate Action Plan Measures | Consistency |
|---|---|
| | The TESP is required to comply with BAAQMD's best management practices to control on-site construction exhaust and fugitive dust, as part of Mitigation Measures AQ-1, and AQ-2. |
| **Focus Area: 6: Transportation and Land Use** | |
| Measure 6.1: Transportation Demand Management Program | Consistent<br>The TESP would include measures to reinforce the mixed-use, transit-oriented concept that is fundamental to the land use plan, and encourage walking, biking, and transit usage while reducing the need to drive for daily needs. |
| Measure 6.3: Electric Vehicle Parking | Consistent<br>The TESP would include measures to offer EV charging stations in parking areas. |
| **Focus Area 7: Urban Heat Island Effect** | |
| Measure 7.1: Urban Forestry | Consistent<br>The TESP would include measures to introduce and provide ample native landscaping, trees, and shrubs to the community along streets, sidewalks, communal areas, trails, and parks, and regularly maintain trees. |
| Measure 7.2: Urban Cooling | Consistent<br>The TESP would include measures to orient buildings to align with the sun to minimize the effects of the hot summer sun, and design the landscape with the most effective, broad branching trees and shrubs that provide shade and comfort to communal areas, sidewalks, and trails. |

As indicated in Table 10, the TESP would include implementing policies and measures that are generally consistent with the City's Climate Action Plan.

## Attachment 1: CalEEMod Modeling and Assumptions

# E. Tasman

### Santa Clara County, Annual

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Elementary School | 600.00 | Student | 0.00 | 50,162.02 | 50 |
| Apartments Mid Rise | 4,500.00 | Dwelling Unit | 41.40 | 4,500,000.00 | 12285 |
| Strip Mall | 106.00 | 1000sqft | 0.00 | 106,000.00 | 265 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 58 |
| **Climate Zone** | 4 | | | **Operational Year** | 2030 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 380 | **CH4 Intensity (lb/MWhr)** | 0.029 | **N2O Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Santa Clara GP = 380 (post 2020 when coal phased out) and 0.029, 0.00617

Land Use - Project Site = 41.4 acres. School = 50 workers, Retail = 265, Housing = 2.73pphh = 12,28 -> total = 12,600

Construction Phase -

Off-road Equipment -

Vehicle Trips - Using TIA trip generation and VMT data. No passby or diverted

Woodstoves - no woodstoves or woodburning = 1,444 nat gas fireplaces

Energy Use -

Water And Wastewater - All WTP treatment

Consumer Products - Consumer Products adjusted for change in inventory and population projections = 78% of 2008 emissions 0.0000167

Area Coating -

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConsumerProducts | ROG_EF | 2.14E-05 | 1.67E-05 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberGas | 675.00 | 1,440.00 |
| tblFireplaces | NumberWood | 765.00 | 0.00 |
| tblLandUse | LotAcreage | 1.15 | 0.00 |
| tblLandUse | LotAcreage | 118.42 | 41.40 |
| tblLandUse | LotAcreage | 2.43 | 0.00 |
| tblLandUse | Population | 0.00 | 50.00 |
| tblLandUse | Population | 12,870.00 | 12,285.00 |
| tblLandUse | Population | 0.00 | 265.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 380 |
| tblVehicleTrips | CC_TL | 7.30 | 2.33 |
| tblVehicleTrips | CNW_TL | 7.30 | 2.33 |
| tblVehicleTrips | CW_TL | 9.50 | 2.33 |
| tblVehicleTrips | DV_TP | 11.00 | 0.00 |
| tblVehicleTrips | DV_TP | 25.00 | 0.00 |

| | | | |
|---|---|---|---|
| tblVehicleTrips | DV_TP | 40.00 | 0.00 |
| tblVehicleTrips | HO_TL | 5.70 | 5.27 |
| tblVehicleTrips | HS_TL | 4.80 | 5.27 |
| tblVehicleTrips | HW_TL | 10.80 | 5.27 |
| tblVehicleTrips | PB_TP | 3.00 | 0.00 |
| tblVehicleTrips | PB_TP | 12.00 | 0.00 |
| tblVehicleTrips | PB_TP | 15.00 | 0.00 |
| tblVehicleTrips | PR_TP | 86.00 | 100.00 |
| tblVehicleTrips | PR_TP | 63.00 | 100.00 |
| tblVehicleTrips | PR_TP | 45.00 | 100.00 |
| tblVehicleTrips | ST_TR | 6.39 | 4.45 |
| tblVehicleTrips | ST_TR | 42.04 | 48.05 |
| tblVehicleTrips | SU_TR | 5.86 | 4.08 |
| tblVehicleTrips | SU_TR | 20.43 | 23.35 |
| tblVehicleTrips | WD_TR | 6.65 | 4.63 |
| tblVehicleTrips | WD_TR | 1.29 | 1.05 |
| tblVehicleTrips | WD_TR | 44.32 | 50.66 |
| tblWater | AerobicPercent | 87.46 | 100.00 |
| tblWater | AerobicPercent | 87.46 | 100.00 |
| tblWater | AerobicPercent | 87.46 | 100.00 |
| tblWater | AnaerobicandFacultativeLagoonsPercent | 2.21 | 0.00 |
| tblWater | AnaerobicandFacultativeLagoonsPercent | 2.21 | 0.00 |
| tblWater | AnaerobicandFacultativeLagoonsPercent | 2.21 | 0.00 |
| tblWater | SepticTankPercent | 10.33 | 0.00 |
| tblWater | SepticTankPercent | 10.33 | 0.00 |
| tblWater | SepticTankPercent | 10.33 | 0.00 |
| tblWoodstoves | WoodstoveWoodMass | 582.40 | 0.00 |

## 2.0 Emissions Summary

### 2.1 Overall Construction

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2019 | 1.2268 | 8.6091 | 8.8722 | 0.0264 | 2.1691 | 0.2720 | 2.4412 | 0.7062 | 0.2530 | 0.9593 | 0.0000 | 2,414.0278 | 2,414.0278 | 0.2055 | 0.0000 | 2,419.1642 |
| 2020 | 1.9747 | 11.1061 | 15.0238 | 0.0541 | 3.8604 | 0.2059 | 4.0663 | 1.0368 | 0.1938 | 1.2306 | 0.0000 | 4,975.6649 | 4,975.6649 | 0.2257 | 0.0000 | 4,981.3065 |
| 2021 | 1.7885 | 9.9910 | 13.8094 | 0.0526 | 3.8457 | 0.1616 | 4.0073 | 1.0329 | 0.1518 | 1.1847 | 0.0000 | 4,839.2292 | 4,839.2292 | 0.2118 | 0.0000 | 4,844.5247 |
| 2022 | 33.2870 | 4.3300 | 6.3187 | 0.0238 | 1.7825 | 0.0782 | 1.8607 | 0.4784 | 0.0732 | 0.5516 | 0.0000 | 2,186.8942 | 2,186.8942 | 0.1064 | 0.0000 | 2,189.5537 |
| **Maximum** | **33.2870** | **11.1061** | **15.0238** | **0.0541** | **3.8604** | **0.2720** | **4.0663** | **1.0368** | **0.2530** | **1.2306** | **0.0000** | **4,975.6649** | **4,975.6649** | **0.2257** | **0.0000** | **4,981.3065** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | 1.2268 | 8.6091 | 8.8722 | 0.0264 | 2.1691 | 0.2720 | 2.4412 | 0.7062 | 0.2530 | 0.9593 | 0.0000 | 2,414.0273 | 2,414.0273 | 0.2055 | 0.0000 | 2,419.1636 |
| 2020 | 1.9747 | 11.1061 | 15.0238 | 0.0541 | 3.8604 | 0.2059 | 4.0663 | 1.0368 | 0.1938 | 1.2306 | 0.0000 | 4,975.6645 | 4,975.6645 | 0.2257 | 0.0000 | 4,981.3061 |
| 2021 | 1.7885 | 9.9910 | 13.8094 | 0.0526 | 3.8457 | 0.1616 | 4.0073 | 1.0329 | 0.1518 | 1.1847 | 0.0000 | 4,839.2288 | 4,839.2288 | 0.2118 | 0.0000 | 4,844.5243 |
| 2022 | 33.2870 | 4.3300 | 6.3187 | 0.0238 | 1.7825 | 0.0782 | 1.8607 | 0.4784 | 0.0732 | 0.5516 | 0.0000 | 2,186.8940 | 2,186.8940 | 0.1064 | 0.0000 | 2,189.5534 |
| **Maximum** | **33.2870** | **11.1061** | **15.0238** | **0.0541** | **3.8604** | **0.2720** | **4.0663** | **1.0368** | **0.2530** | **1.2306** | **0.0000** | **4,975.6645** | **4,975.6645** | **0.2257** | **0.0000** | **4,981.3061** |

| | **ROG** | **NOx** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **Bio- CO2** | **NBio-CO2** | **Total CO2** | **CH4** | **N20** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

| **Quarter** | **Start Date** | **End Date** | **Maximum Unmitigated ROG + NOX (tons/quarter)** | **Maximum Mitigated ROG + NOX (tons/quarter)** |
|---|---|---|---|---|
| **1** | **1-1-2019** | **3-31-2019** | 1.3424 | 1.3424 |
| **2** | **4-1-2019** | **6-30-2019** | 1.8564 | 1.8564 |
| **3** | **7-1-2019** | **9-30-2019** | 2.9536 | 2.9536 |
| **4** | **10-1-2019** | **12-31-2019** | 3.7150 | 3.7150 |
| **5** | **1-1-2020** | **3-31-2020** | 3.3093 | 3.3093 |
| **6** | **4-1-2020** | **6-30-2020** | 3.2102 | 3.2102 |
| **7** | **7-1-2020** | **9-30-2020** | 3.2455 | 3.2455 |
| **8** | **10-1-2020** | **12-31-2020** | 3.3457 | 3.3457 |
| **9** | **1-1-2021** | **3-31-2021** | 2.9581 | 2.9581 |
| **10** | **4-1-2021** | **6-30-2021** | 2.9051 | 2.9051 |
| **11** | **7-1-2021** | **9-30-2021** | 2.9370 | 2.9370 |
| **12** | **10-1-2021** | **12-31-2021** | 3.0238 | 3.0238 |
| **13** | **1-1-2022** | **3-31-2022** | 2.7486 | 2.7486 |
| **14** | **4-1-2022** | **6-30-2022** | 2.0942 | 2.0942 |
| **15** | **7-1-2022** | **9-30-2022** | 16.7553 | 16.7553 |
| | | **Highest** | 16.7553 | 16.7553 |

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 18.4555 | 0.5395 | 33.3972 | 2.7600e-003 | | 0.1979 | 0.1979 | | 0.1979 | 0.1979 | 0.0000 | 234.3608 | 234.3608 | 0.0555 | 3.3000e-003 | 236.7299 |
| Energy | 0.2160 | 1.8491 | 0.8107 | 0.0118 | | 0.1492 | 0.1492 | | 0.1492 | 0.1492 | 0.0000 | 5,581.4620 | 5,581.4620 | 0.3038 | 0.0936 | 5,616.9396 |
| Mobile | 3.5021 | 14.9021 | 35.9412 | 0.1470 | 16.5923 | 0.1011 | 16.6934 | 4.4404 | 0.0939 | 4.5343 | 0.0000 | 13,533.6915 | 13,533.6915 | 0.4090 | 0.0000 | 13,543.9164 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 465.0117 | 0.0000 | 465.0117 | 27.4814 | 0.0000 | 1,152.0468 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 107.0247 | 398.8003 | 505.8250 | 0.3988 | 0.2390 | 587.0292 |
| **Total** | **22.1736** | **17.2907** | **70.1492** | **0.1615** | **16.5923** | **0.4482** | **17.0405** | **4.4404** | **0.4410** | **4.8814** | **572.0364** | **19,748.3146** | **20,320.3510** | **28.6485** | **0.3359** | **21,136.6619** |

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 18.4555 | 0.5395 | 33.3972 | 2.7600e-003 | | 0.1979 | 0.1979 | | 0.1979 | 0.1979 | 0.0000 | 234.3608 | 234.3608 | 0.0555 | 3.3000e-003 | 236.7299 |
| Energy | 0.2160 | 1.8491 | 0.8107 | 0.0118 | | 0.1492 | 0.1492 | | 0.1492 | 0.1492 | 0.0000 | 5,581.4620 | 5,581.4620 | 0.3038 | 0.0936 | 5,616.9396 |
| Mobile | 3.5021 | 14.9021 | 35.9412 | 0.1470 | 16.5923 | 0.1011 | 16.6934 | 4.4404 | 0.0939 | 4.5343 | 0.0000 | 13,533.6915 | 13,533.6915 | 0.4090 | 0.0000 | 13,543.9164 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 465.0117 | 0.0000 | 465.0117 | 27.4814 | 0.0000 | 1,152.0468 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 107.0247 | 398.8003 | 505.8250 | 0.3988 | 0.2390 | 587.0292 |
| **Total** | **22.1736** | **17.2907** | **70.1492** | **0.1615** | **16.5923** | **0.4482** | **17.0405** | **4.4404** | **0.4410** | **4.8814** | **572.0364** | **19,748.3146** | **20,320.3510** | **28.6485** | **0.3359** | **21,136.6619** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 1/1/2019 | 3/11/2019 | 5 | 50 | |
| 2 | Site Preparation | Site Preparation | 3/12/2019 | 4/22/2019 | 5 | 30 | |
| 3 | Grading | Grading | 4/23/2019 | 8/5/2019 | 5 | 75 | |
| 4 | Building Construction | Building Construction | 8/6/2019 | 6/6/2022 | 5 | 740 | |
| 5 | Paving | Paving | 6/7/2022 | 8/22/2022 | 5 | 55 | |
| 6 | Architectural Coating | Architectural Coating | 8/23/2022 | 11/7/2022 | 5 | 55 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 187.5**

**Acres of Paving: 0**

**Residential Indoor: 9,112,500; Residential Outdoor: 3,037,500; Non-Residential Indoor: 234,243; Non-Residential Outdoor: 78,081;**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Excavators | 3 | 8.00 | 158 | 0.38 |
| Demolition | Rubber Tired Dozers | 2 | 8.00 | 247 | 0.40 |
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 3,295.00 | 507.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 659.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

## 3.2 Demolition - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0878 | 0.8946 | 0.5515 | 9.7000e-004 | | 0.0449 | 0.0449 | | 0.0417 | 0.0417 | 0.0000 | 86.5658 | 86.5658 | 0.0241 | 0.0000 | 87.1679 |
| **Total** | **0.0878** | **0.8946** | **0.5515** | **9.7000e-004** | | **0.0449** | **0.0449** | | **0.0417** | **0.0417** | **0.0000** | **86.5658** | **86.5658** | **0.0241** | **0.0000** | **87.1679** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.3600e-003 | 1.0100e-003 | 0.0105 | 3.0000e-005 | 2.9700e-003 | 2.0000e-005 | 2.9900e-003 | 7.9000e-004 | 2.0000e-005 | 8.1000e-004 | 0.0000 | 2.6328 | 2.6328 | 7.0000e-005 | 0.0000 | 2.6346 |
| **Total** | **1.3600e-003** | **1.0100e-003** | **0.0105** | **3.0000e-005** | **2.9700e-003** | **2.0000e-005** | **2.9900e-003** | **7.9000e-004** | **2.0000e-005** | **8.1000e-004** | **0.0000** | **2.6328** | **2.6328** | **7.0000e-005** | **0.0000** | **2.6346** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0878 | 0.8946 | 0.5515 | 9.7000e-004 | | 0.0449 | 0.0449 | | 0.0417 | 0.0417 | 0.0000 | 86.5657 | 86.5657 | 0.0241 | 0.0000 | 87.1678 |
| **Total** | **0.0878** | **0.8946** | **0.5515** | **9.7000e-004** | | **0.0449** | **0.0449** | | **0.0417** | **0.0417** | **0.0000** | **86.5657** | **86.5657** | **0.0241** | **0.0000** | **87.1678** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.3600e-003 | 1.0100e-003 | 0.0105 | 3.0000e-005 | 2.9700e-003 | 2.0000e-005 | 2.9900e-003 | 7.9000e-004 | 2.0000e-005 | 8.1000e-004 | 0.0000 | 2.6328 | 2.6328 | 7.0000e-005 | 0.0000 | 2.6346 |
| **Total** | **1.3600e-003** | **1.0100e-003** | **0.0105** | **3.0000e-005** | **2.9700e-003** | **2.0000e-005** | **2.9900e-003** | **7.9000e-004** | **2.0000e-005** | **8.1000e-004** | **0.0000** | **2.6328** | **2.6328** | **7.0000e-005** | **0.0000** | **2.6346** |

## 3.3 Site Preparation - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.2710 | 0.0000 | 0.2710 | 0.1490 | 0.0000 | 0.1490 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0650 | 0.6836 | 0.3310 | 5.7000e-004 | | 0.0359 | 0.0359 | | 0.0330 | 0.0330 | 0.0000 | 51.2530 | 51.2530 | 0.0162 | 0.0000 | 51.6584 |
| **Total** | **0.0650** | **0.6836** | **0.3310** | **5.7000e-004** | **0.2710** | **0.0359** | **0.3069** | **0.1490** | **0.0330** | **0.1820** | **0.0000** | **51.2530** | **51.2530** | **0.0162** | **0.0000** | **51.6584** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 9.8000e-004 | 7.3000e-004 | 7.5400e-003 | 2.0000e-005 | 2.1400e-003 | 1.0000e-005 | 2.1600e-003 | 5.7000e-004 | 1.0000e-005 | 5.8000e-004 | 0.0000 | 1.8956 | 1.8956 | 5.0000e-005 | 0.0000 | 1.8969 |
| **Total** | **9.8000e-004** | **7.3000e-004** | **7.5400e-003** | **2.0000e-005** | **2.1400e-003** | **1.0000e-005** | **2.1600e-003** | **5.7000e-004** | **1.0000e-005** | **5.8000e-004** | **0.0000** | **1.8956** | **1.8956** | **5.0000e-005** | **0.0000** | **1.8969** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.2710 | 0.0000 | 0.2710 | 0.1490 | 0.0000 | 0.1490 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0650 | 0.6836 | 0.3309 | 5.7000e-004 | | 0.0359 | 0.0359 | | 0.0330 | 0.0330 | 0.0000 | 51.2530 | 51.2530 | 0.0162 | 0.0000 | 51.6584 |
| **Total** | **0.0650** | **0.6836** | **0.3309** | **5.7000e-004** | **0.2710** | **0.0359** | **0.3069** | **0.1490** | **0.0330** | **0.1820** | **0.0000** | **51.2530** | **51.2530** | **0.0162** | **0.0000** | **51.6584** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 9.8000e-004 | 7.3000e-004 | 7.5400e-003 | 2.0000e-005 | 2.1400e-003 | 1.0000e-005 | 2.1600e-003 | 5.7000e-004 | 1.0000e-005 | 5.8000e-004 | 0.0000 | 1.8956 | 1.8956 | 5.0000e-005 | 0.0000 | 1.8969 |
| **Total** | **9.8000e-004** | **7.3000e-004** | **7.5400e-003** | **2.0000e-005** | **2.1400e-003** | **1.0000e-005** | **2.1600e-003** | **5.7000e-004** | **1.0000e-005** | **5.8000e-004** | **0.0000** | **1.8956** | **1.8956** | **5.0000e-005** | **0.0000** | **1.8969** |

### 3.4 Grading - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.3253 | 0.0000 | 0.3253 | 0.1349 | 0.0000 | 0.1349 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1777 | 2.0445 | 1.2516 | 2.3300e-003 | | 0.0894 | 0.0894 | | 0.0822 | 0.0822 | 0.0000 | 208.8800 | 208.8800 | 0.0661 | 0.0000 | 210.5321 |
| **Total** | **0.1777** | **2.0445** | **1.2516** | **2.3300e-003** | **0.3253** | **0.0894** | **0.4146** | **0.1349** | **0.0822** | **0.2171** | **0.0000** | **208.8800** | **208.8800** | **0.0661** | **0.0000** | **210.5321** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.7200e-003 | 2.0300e-003 | 0.0210 | 6.0000e-005 | 5.9500e-003 | 4.0000e-005 | 5.9900e-003 | 1.5800e-003 | 4.0000e-005 | 1.6200e-003 | 0.0000 | 5.2656 | 5.2656 | 1.4000e-004 | 0.0000 | 5.2692 |
| **Total** | **2.7200e-003** | **2.0300e-003** | **0.0210** | **6.0000e-005** | **5.9500e-003** | **4.0000e-005** | **5.9900e-003** | **1.5800e-003** | **4.0000e-005** | **1.6200e-003** | **0.0000** | **5.2656** | **5.2656** | **1.4000e-004** | **0.0000** | **5.2692** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.3253 | 0.0000 | 0.3253 | 0.1349 | 0.0000 | 0.1349 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1777 | 2.0445 | 1.2516 | 2.3300e-003 | | 0.0894 | 0.0894 | | 0.0822 | 0.0822 | 0.0000 | 208.8797 | 208.8797 | 0.0661 | 0.0000 | 210.5319 |
| **Total** | **0.1777** | **2.0445** | **1.2516** | **2.3300e-003** | **0.3253** | **0.0894** | **0.4146** | **0.1349** | **0.0822** | **0.2171** | **0.0000** | **208.8797** | **208.8797** | **0.0661** | **0.0000** | **210.5319** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.7200e-003 | 2.0300e-003 | 0.0210 | 6.0000e-005 | 5.9500e-003 | 4.0000e-005 | 5.9900e-003 | 1.5800e-003 | 4.0000e-005 | 1.6200e-003 | 0.0000 | 5.2656 | 5.2656 | 1.4000e-004 | 0.0000 | 5.2692 |
| **Total** | **2.7200e-003** | **2.0300e-003** | **0.0210** | **6.0000e-005** | **5.9500e-003** | **4.0000e-005** | **5.9900e-003** | **1.5800e-003** | **4.0000e-005** | **1.6200e-003** | **0.0000** | **5.2656** | **5.2656** | **1.4000e-004** | **0.0000** | **5.2692** |

## 3.5 Building Construction - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1251 | 1.1172 | 0.9097 | 1.4300e-003 | | 0.0684 | 0.0684 | | 0.0643 | 0.0643 | 0.0000 | 124.6052 | 124.6052 | 0.0304 | 0.0000 | 125.3641 |
| **Total** | **0.1251** | **1.1172** | **0.9097** | **1.4300e-003** | | **0.0684** | **0.0684** | | **0.0643** | **0.0643** | **0.0000** | **124.6052** | **124.6052** | **0.0304** | **0.0000** | **125.3641** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.1318 | 3.3932 | 0.9109 | 7.3800e-003 | 0.1768 | 0.0244 | 0.2011 | 0.0511 | 0.0233 | 0.0744 | 0.0000 | 706.8465 | 706.8465 | 0.0351 | 0.0000 | 707.7231 |
| Worker | 0.6343 | 0.4723 | 4.8786 | 0.0136 | 1.3851 | 9.1400e-003 | 1.3942 | 0.3684 | 8.4200e-003 | 0.3768 | 0.0000 | 1,226.0832 | 1,226.0832 | 0.0334 | 0.0000 | 1,226.9178 |
| **Total** | **0.7660** | **3.8655** | **5.7895** | **0.0210** | **1.5618** | **0.0335** | **1.5953** | **0.4195** | **0.0317** | **0.4512** | **0.0000** | **1,932.9297** | **1,932.9297** | **0.0684** | **0.0000** | **1,934.6409** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1251 | 1.1172 | 0.9097 | 1.4300e-003 | | 0.0684 | 0.0684 | | 0.0643 | 0.0643 | 0.0000 | 124.6051 | 124.6051 | 0.0304 | 0.0000 | 125.3640 |
| **Total** | **0.1251** | **1.1172** | **0.9097** | **1.4300e-003** | | **0.0684** | **0.0684** | | **0.0643** | **0.0643** | **0.0000** | **124.6051** | **124.6051** | **0.0304** | **0.0000** | **125.3640** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.1318 | 3.3932 | 0.9109 | 7.3800e-003 | 0.1768 | 0.0244 | 0.2011 | 0.0511 | 0.0233 | 0.0744 | 0.0000 | 706.8465 | 706.8465 | 0.0351 | 0.0000 | 707.7231 |
| Worker | 0.6343 | 0.4723 | 4.8786 | 0.0136 | 1.3851 | 9.1400e-003 | 1.3942 | 0.3684 | 8.4200e-003 | 0.3768 | 0.0000 | 1,226.0832 | 1,226.0832 | 0.0334 | 0.0000 | 1,226.9178 |
| **Total** | **0.7660** | **3.8655** | **5.7895** | **0.0210** | **1.5618** | **0.0335** | **1.5953** | **0.4195** | **0.0317** | **0.4512** | **0.0000** | **1,932.9297** | **1,932.9297** | **0.0684** | **0.0000** | **1,934.6409** |

## 3.5 Building Construction - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.2777 | 2.5134 | 2.2072 | 3.5300e-003 | | 0.1463 | 0.1463 | | 0.1376 | 0.1376 | 0.0000 | 303.4091 | 303.4091 | 0.0740 | 0.0000 | 305.2596 |
| **Total** | **0.2777** | **2.5134** | **2.2072** | **3.5300e-003** | | **0.1463** | **0.1463** | | **0.1376** | **0.1376** | **0.0000** | **303.4091** | **303.4091** | **0.0740** | **0.0000** | **305.2596** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.2632 | 7.5625 | 2.0141 | 0.0181 | 0.4369 | 0.0375 | 0.4744 | 0.1263 | 0.0358 | 0.1622 | 0.0000 | 1,736.4245 | 1,736.4245 | 0.0796 | 0.0000 | 1,738.4153 |
| Worker | 1.4338 | 1.0303 | 10.8025 | 0.0325 | 3.4234 | 0.0221 | 3.4456 | 0.9105 | 0.0204 | 0.9309 | 0.0000 | 2,935.8313 | 2,935.8313 | 0.0720 | 0.0000 | 2,937.6316 |
| **Total** | **1.6970** | **8.5927** | **12.8166** | **0.0506** | **3.8604** | **0.0596** | **3.9199** | **1.0368** | **0.0562** | **1.0930** | **0.0000** | **4,672.2558** | **4,672.2558** | **0.1516** | **0.0000** | **4,676.0469** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.2777 | 2.5134 | 2.2072 | 3.5300e-003 | | 0.1463 | 0.1463 | | 0.1376 | 0.1376 | 0.0000 | 303.4087 | 303.4087 | 0.0740 | 0.0000 | 305.2592 |
| **Total** | **0.2777** | **2.5134** | **2.2072** | **3.5300e-003** | | **0.1463** | **0.1463** | | **0.1376** | **0.1376** | **0.0000** | **303.4087** | **303.4087** | **0.0740** | **0.0000** | **305.2592** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.2632 | 7.5625 | 2.0141 | 0.0181 | 0.4369 | 0.0375 | 0.4744 | 0.1263 | 0.0358 | 0.1622 | 0.0000 | 1,736.4245 | 1,736.4245 | 0.0796 | 0.0000 | 1,738.4153 |
| Worker | 1.4338 | 1.0303 | 10.8025 | 0.0325 | 3.4234 | 0.0221 | 3.4456 | 0.9105 | 0.0204 | 0.9309 | 0.0000 | 2,935.8313 | 2,935.8313 | 0.0720 | 0.0000 | 2,937.6316 |
| **Total** | **1.6970** | **8.5927** | **12.8166** | **0.0506** | **3.8604** | **0.0596** | **3.9199** | **1.0368** | **0.0562** | **1.0930** | **0.0000** | **4,672.2558** | **4,672.2558** | **0.1516** | **0.0000** | **4,676.0469** |

### 3.5 Building Construction - 2021

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Off-Road | 0.2481 | 2.2749 | 2.1631 | 3.5100e-003 | | 0.1251 | 0.1251 | | 0.1176 | 0.1176 | 0.0000 | 302.2867 | 302.2867 | 0.0729 | 0.0000 | 304.1099 |
| **Total** | **0.2481** | **2.2749** | **2.1631** | **3.5100e-003** | | **0.1251** | **0.1251** | | **0.1176** | **0.1176** | **0.0000** | **302.2867** | **302.2867** | **0.0729** | **0.0000** | **304.1099** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.2158 | 6.7989 | 1.8098 | 0.0179 | 0.4353 | 0.0151 | 0.4504 | 0.1259 | 0.0144 | 0.1403 | 0.0000 | 1,713.8291 | 1,713.8291 | 0.0747 | 0.0000 | 1,715.6963 |
| Worker | 1.3247 | 0.9172 | 9.8365 | 0.0312 | 3.4104 | 0.0215 | 3.4318 | 0.9070 | 0.0198 | 0.9268 | 0.0000 | 2,823.1134 | 2,823.1134 | 0.0642 | 0.0000 | 2,824.7185 |
| **Total** | **1.5404** | **7.7161** | **11.6463** | **0.0491** | **3.8457** | **0.0365** | **3.8822** | **1.0329** | **0.0342** | **1.0670** | **0.0000** | **4,536.9425** | **4,536.9425** | **0.1389** | **0.0000** | **4,540.4148** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Off-Road | 0.2481 | 2.2749 | 2.1631 | 3.5100e-003 | | 0.1251 | 0.1251 | | 0.1176 | 0.1176 | 0.0000 | 302.2863 | 302.2863 | 0.0729 | 0.0000 | 304.1095 |
| **Total** | **0.2481** | **2.2749** | **2.1631** | **3.5100e-003** | | **0.1251** | **0.1251** | | **0.1176** | **0.1176** | **0.0000** | **302.2863** | **302.2863** | **0.0729** | **0.0000** | **304.1095** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/yr | | | | | | | | MT/yr | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.2158 | 6.7989 | 1.8098 | 0.0179 | 0.4353 | 0.0151 | 0.4504 | 0.1259 | 0.0144 | 0.1403 | 0.0000 | 1,713.8291 | 1,713.8291 | 0.0747 | 0.0000 | 1,715.6963 |
| Worker | 1.3247 | 0.9172 | 9.8365 | 0.0312 | 3.4104 | 0.0215 | 3.4318 | 0.9070 | 0.0198 | 0.9268 | 0.0000 | 2,823.1134 | 2,823.1134 | 0.0642 | 0.0000 | 2,824.7185 |
| **Total** | **1.5404** | **7.7161** | **11.6463** | **0.0491** | **3.8457** | **0.0365** | **3.8822** | **1.0329** | **0.0342** | **1.0670** | **0.0000** | **4,536.9425** | **4,536.9425** | **0.1389** | **0.0000** | **4,540.4148** |

## 3.5 Building Construction - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/yr | | | | | | | | MT/yr | | |
| Off-Road | 0.0947 | 0.8667 | 0.9082 | 1.4900e-003 | | 0.0449 | 0.0449 | | 0.0422 | 0.0422 | 0.0000 | 128.6075 | 128.6075 | 0.0308 | 0.0000 | 129.3778 |
| **Total** | **0.0947** | **0.8667** | **0.9082** | **1.4900e-003** | | **0.0449** | **0.0449** | | **0.0422** | **0.0422** | **0.0000** | **128.6075** | **128.6075** | **0.0308** | **0.0000** | **129.3778** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/yr | | | | | | | | MT/yr | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0856 | 2.7333 | 0.7249 | 7.5200e-003 | 0.1851 | 5.5700e-003 | 0.1907 | 0.0535 | 5.3300e-003 | 0.0589 | 0.0000 | 721.8968 | 721.8968 | 0.0303 | 0.0000 | 722.6550 |
| Worker | 0.5258 | 0.3499 | 3.8450 | 0.0128 | 1.4504 | 8.9300e-003 | 1.4593 | 0.3857 | 8.2200e-003 | 0.3940 | 0.0000 | 1,157.0229 | 1,157.0229 | 0.0245 | 0.0000 | 1,157.6351 |
| **Total** | **0.6114** | **3.0832** | **4.5699** | **0.0203** | **1.6355** | **0.0145** | **1.6500** | **0.4393** | **0.0136** | **0.4528** | **0.0000** | **1,878.9197** | **1,878.9197** | **0.0548** | **0.0000** | **1,880.2901** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/yr | | | | | | | | MT/yr | | |
| Off-Road | 0.0947 | 0.8667 | 0.9082 | 1.4900e-003 | | 0.0449 | 0.0449 | | 0.0422 | 0.0422 | 0.0000 | 128.6074 | 128.6074 | 0.0308 | 0.0000 | 129.3776 |
| **Total** | **0.0947** | **0.8667** | **0.9082** | **1.4900e-003** | | **0.0449** | **0.0449** | | **0.0422** | **0.0422** | **0.0000** | **128.6074** | **128.6074** | **0.0308** | **0.0000** | **129.3776** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0856 | 2.7333 | 0.7249 | 7.5200e-003 | 0.1851 | 5.5700e-003 | 0.1907 | 0.0535 | 5.3300e-003 | 0.0589 | 0.0000 | 721.8968 | 721.8968 | 0.0303 | 0.0000 | 722.6550 |
| Worker | 0.5258 | 0.3499 | 3.8450 | 0.0128 | 1.4504 | 8.9300e-003 | 1.4593 | 0.3857 | 8.2200e-003 | 0.3940 | 0.0000 | 1,157.0229 | 1,157.0229 | 0.0245 | 0.0000 | 1,157.6351 |
| **Total** | **0.6114** | **3.0832** | **4.5699** | **0.0203** | **1.6355** | **0.0145** | **1.6500** | **0.4393** | **0.0136** | **0.4528** | **0.0000** | **1,878.9197** | **1,878.9197** | **0.0548** | **0.0000** | **1,880.2901** |

## 3.6 Paving - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Off-Road | 0.0303 | 0.3059 | 0.4010 | 6.3000e-004 | | 0.0156 | 0.0156 | | 0.0144 | 0.0144 | 0.0000 | 55.0758 | 55.0758 | 0.0178 | 0.0000 | 55.5211 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0303** | **0.3059** | **0.4010** | **6.3000e-004** | | **0.0156** | **0.0156** | | **0.0144** | **0.0144** | **0.0000** | **55.0758** | **55.0758** | **0.0178** | **0.0000** | **55.5211** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.1900e-003 | 7.9000e-004 | 8.6700e-003 | 3.0000e-005 | 3.2700e-003 | 2.0000e-005 | 3.2900e-003 | 8.7000e-004 | 2.0000e-005 | 8.9000e-004 | 0.0000 | 2.6099 | 2.6099 | 6.0000e-005 | 0.0000 | 2.6112 |
| **Total** | **1.1900e-003** | **7.9000e-004** | **8.6700e-003** | **3.0000e-005** | **3.2700e-003** | **2.0000e-005** | **3.2900e-003** | **8.7000e-004** | **2.0000e-005** | **8.9000e-004** | **0.0000** | **2.6099** | **2.6099** | **6.0000e-005** | **0.0000** | **2.6112** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | tons/yr | | | | | | | | MT/yr | | | |
| Off-Road | 0.0303 | 0.3059 | 0.4010 | 6.3000e-004 | | 0.0156 | 0.0156 | | 0.0144 | 0.0144 | 0.0000 | 55.0757 | 55.0757 | 0.0178 | 0.0000 | 55.5210 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0303** | **0.3059** | **0.4010** | **6.3000e-004** | | **0.0156** | **0.0156** | | **0.0144** | **0.0144** | **0.0000** | **55.0757** | **55.0757** | **0.0178** | **0.0000** | **55.5210** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.1900e-003 | 7.9000e-004 | 8.6700e-003 | 3.0000e-005 | 3.2700e-003 | 2.0000e-005 | 3.2900e-003 | 8.7000e-004 | 2.0000e-005 | 8.9000e-004 | 0.0000 | 2.6099 | 2.6099 | 6.0000e-005 | 0.0000 | 2.6112 |
| **Total** | **1.1900e-003** | **7.9000e-004** | **8.6700e-003** | **3.0000e-005** | **3.2700e-003** | **2.0000e-005** | **3.2900e-003** | **8.7000e-004** | **2.0000e-005** | **8.9000e-004** | **0.0000** | **2.6099** | **2.6099** | **6.0000e-005** | **0.0000** | **2.6112** |

## 3.7 Architectural Coating - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 32.4916 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.6200e-003 | 0.0387 | 0.0499 | 8.0000e-005 | | 2.2500e-003 | 2.2500e-003 | | 2.2500e-003 | 2.2500e-003 | 0.0000 | 7.0215 | 7.0215 | 4.6000e-004 | 0.0000 | 7.0329 |
| **Total** | **32.4972** | **0.0387** | **0.0499** | **8.0000e-005** | | **2.2500e-003** | **2.2500e-003** | | **2.2500e-003** | **2.2500e-003** | **0.0000** | **7.0215** | **7.0215** | **4.6000e-004** | **0.0000** | **7.0329** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0521 | 0.0347 | 0.3810 | 1.2700e-003 | 0.1437 | 8.8000e-004 | 0.1446 | 0.0382 | 8.1000e-004 | 0.0390 | 0.0000 | 114.6599 | 114.6599 | 2.4300e-003 | 0.0000 | 114.7206 |
| **Total** | **0.0521** | **0.0347** | **0.3810** | **1.2700e-003** | **0.1437** | **8.8000e-004** | **0.1446** | **0.0382** | **8.1000e-004** | **0.0390** | **0.0000** | **114.6599** | **114.6599** | **2.4300e-003** | **0.0000** | **114.7206** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 32.4916 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.6200e-003 | 0.0387 | 0.0499 | 8.0000e-005 | | 2.2500e-003 | 2.2500e-003 | | 2.2500e-003 | 2.2500e-003 | 0.0000 | 7.0214 | 7.0214 | 4.6000e-004 | 0.0000 | 7.0329 |
| **Total** | **32.4972** | **0.0387** | **0.0499** | **8.0000e-005** | | **2.2500e-003** | **2.2500e-003** | | **2.2500e-003** | **2.2500e-003** | **0.0000** | **7.0214** | **7.0214** | **4.6000e-004** | **0.0000** | **7.0329** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0521 | 0.0347 | 0.3810 | 1.2700e-003 | 0.1437 | 8.8000e-004 | 0.1446 | 0.0382 | 8.1000e-004 | 0.0390 | 0.0000 | 114.6599 | 114.6599 | 2.4300e-003 | 0.0000 | 114.7206 |
| **Total** | **0.0521** | **0.0347** | **0.3810** | **1.2700e-003** | **0.1437** | **8.8000e-004** | **0.1446** | **0.0382** | **8.1000e-004** | **0.0390** | **0.0000** | **114.6599** | **114.6599** | **2.4300e-003** | **0.0000** | **114.7206** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 3.5021 | 14.9021 | 35.9412 | 0.1470 | 16.5923 | 0.1011 | 16.6934 | 4.4404 | 0.0939 | 4.5343 | 0.0000 | 13,533.6915 | 13,533.6915 | 0.4090 | 0.0000 | 13,543.9164 |
| Unmitigated | 3.5021 | 14.9021 | 35.9412 | 0.1470 | 16.5923 | 0.1011 | 16.6934 | 4.4404 | 0.0939 | 4.5343 | 0.0000 | 13,533.6915 | 13,533.6915 | 0.4090 | 0.0000 | 13,543.9164 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Apartments Mid Rise | 20,835.00 | 20,025.00 | 18360.00 | 39,030,077 | 39,030,077 |
| Elementary School | 630.00 | 0.00 | 0.00 | 1,429,974 | 1,429,974 |
| Strip Mall | 5,369.96 | 5,093.30 | 2475.10 | 4,171,004 | 4,171,004 |
| Total | 26,834.96 | 25,118.30 | 20,835.10 | 44,631,055 | 44,631,055 |

### 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C- | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Apartments Mid Rise | 5.27 | 5.27 | 5.27 | 31.00 | 15.00 | 54.00 | 100 | 0 | 0 |
| Elementary School | 9.50 | 7.30 | 7.30 | 65.00 | 30.00 | 5.00 | 100 | 0 | 0 |
| Strip Mall | 2.33 | 2.33 | 2.33 | 16.60 | 64.40 | 19.00 | 100 | 0 | 0 |

### 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 0.621541 | 0.034056 | 0.180136 | 0.101248 | 0.011859 | 0.005060 | 0.013110 | 0.022881 | 0.002221 | 0.001470 | 0.005122 | 0.000646 | 0.000651 |
| Elementary School | 0.621541 | 0.034056 | 0.180136 | 0.101248 | 0.011859 | 0.005060 | 0.013110 | 0.022881 | 0.002221 | 0.001470 | 0.005122 | 0.000646 | 0.000651 |
| Strip Mall | 0.621541 | 0.034056 | 0.180136 | 0.101248 | 0.011859 | 0.005060 | 0.013110 | 0.022881 | 0.002221 | 0.001470 | 0.005122 | 0.000646 | 0.000651 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 3,444.0423 | 3,444.0423 | 0.2628 | 0.0544 | 3,466.8183 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 3,444.0423 | 3,444.0423 | 0.2628 | 0.0544 | 3,466.8183 |
| NaturalGas Mitigated | 0.2160 | 1.8491 | 0.8107 | 0.0118 | | 0.1492 | 0.1492 | | 0.1492 | 0.1492 | 0.0000 | 2,137.4197 | 2,137.4197 | 0.0410 | 0.0392 | 2,150.1213 |
| NaturalGas Unmitigated | 0.2160 | 1.8491 | 0.8107 | 0.0118 | | 0.1492 | 0.1492 | | 0.1492 | 0.1492 | 0.0000 | 2,137.4197 | 2,137.4197 | 0.0410 | 0.0392 | 2,150.1213 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Apartments Mid Rise | 3.88775e+007 | 0.2096 | 1.7914 | 0.7623 | 0.0114 | | 0.1448 | 0.1448 | | 0.1448 | 0.1448 | 0.0000 | 2,074.6528 | 2,074.6528 | 0.0398 | 0.0380 | 2,086.9814 |
| Elementary School | 924988 | 4.9900e-003 | 0.0453 | 0.0381 | 2.7000e-004 | | 3.4500e-003 | 3.4500e-003 | | 3.4500e-003 | 3.4500e-003 | 0.0000 | 49.3609 | 49.3609 | 9.5000e-004 | 9.0000e-004 | 49.6542 |
| Strip Mall | 251220 | 1.3500e-003 | 0.0123 | 0.0103 | 7.0000e-005 | | 9.4000e-004 | 9.4000e-004 | | 9.4000e-004 | 9.4000e-004 | 0.0000 | 13.4061 | 13.4061 | 2.6000e-004 | 2.5000e-004 | 13.4857 |
| **Total** | | **0.2160** | **1.8491** | **0.8107** | **0.0118** | | **0.1492** | **0.1492** | | **0.1492** | **0.1492** | **0.0000** | **2,137.4197** | **2,137.4197** | **0.0410** | **0.0392** | **2,150.1213** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Apartments Mid Rise | 3.88775e+007 | 0.2096 | 1.7914 | 0.7623 | 0.0114 | | 0.1448 | 0.1448 | | 0.1448 | 0.1448 | 0.0000 | 2,074.6528 | 2,074.6528 | 0.0398 | 0.0380 | 2,086.9814 |
| Elementary School | 924988 | 4.9900e-003 | 0.0453 | 0.0381 | 2.7000e-004 | | 3.4500e-003 | 3.4500e-003 | | 3.4500e-003 | 3.4500e-003 | 0.0000 | 49.3609 | 49.3609 | 9.5000e-004 | 9.0000e-004 | 49.6542 |
| Strip Mall | 251220 | 1.3500e-003 | 0.0123 | 0.0103 | 7.0000e-005 | | 9.4000e-004 | 9.4000e-004 | | 9.4000e-004 | 9.4000e-004 | 0.0000 | 13.4061 | 13.4061 | 2.6000e-004 | 2.5000e-004 | 13.4857 |
| **Total** | | **0.2160** | **1.8491** | **0.8107** | **0.0118** | | **0.1492** | **0.1492** | | **0.1492** | **0.1492** | **0.0000** | **2,137.4197** | **2,137.4197** | **0.0410** | **0.0392** | **2,150.1213** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Apartments Mid Rise | 1.85776e+007 | 3,202.1256 | 0.2444 | 0.0506 | 3,223.3018 |
| Elementary School | 270373 | 46.6029 | 3.5600e-003 | 7.4000e-004 | 46.9111 |
| Strip Mall | 1.13314e+006 | 195.3138 | 0.0149 | 3.0800e-003 | 196.6054 |

| Land Use | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| **Total** | | **3,444.0423** | **0.2628** | **0.0544** | **3,466.8183** |

<u>**Mitigated**</u>

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Apartments Mid Rise | 1.85776e+007 | 3,202.1256 | 0.2444 | 0.0506 | 3,223.3018 |
| Elementary School | 270373 | 46.6029 | 3.5600e-003 | 7.4000e-004 | 46.9111 |
| Strip Mall | 1.13314e+006 | 195.3138 | 0.0149 | 3.0800e-003 | 196.6054 |
| **Total** | | **3,444.0423** | **0.2628** | **0.0544** | **3,466.8183** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 18.4555 | 0.5395 | 33.3972 | 2.7600e-003 | | 0.1979 | 0.1979 | | 0.1979 | 0.1979 | 0.0000 | 234.3608 | 234.3608 | 0.0555 | 3.3000e-003 | 236.7299 |
| Unmitigated | 18.4555 | 0.5395 | 33.3972 | 2.7600e-003 | | 0.1979 | 0.1979 | | 0.1979 | 0.1979 | 0.0000 | 234.3608 | 234.3608 | 0.0555 | 3.3000e-003 | 236.7299 |

## 6.2 Area by SubCategory

<u>**Unmitigated**</u>

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 3.2492 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 14.1908 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0182 | 0.1552 | 0.0661 | 9.9000e-004 | | 0.0126 | 0.0126 | | 0.0126 | 0.0126 | 0.0000 | 179.7686 | 179.7686 | 3.4500e-003 | 3.3000e-003 | 180.8369 |
| Landscaping | 0.9974 | 0.3842 | 33.3312 | 1.7600e-003 | | 0.1853 | 0.1853 | | 0.1853 | 0.1853 | 0.0000 | 54.5922 | 54.5922 | 0.0520 | 0.0000 | 55.8930 |
| **Total** | **18.4555** | **0.5395** | **33.3972** | **2.7500e-003** | | **0.1979** | **0.1979** | | **0.1979** | **0.1979** | **0.0000** | **234.3608** | **234.3608** | **0.0555** | **3.3000e-003** | **236.7299** |

<u>**Mitigated**</u>

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architectural Coating | 3.2492 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 14.1908 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0182 | 0.1552 | 0.0661 | 9.9000e-004 | | 0.0126 | 0.0126 | | 0.0126 | 0.0126 | 0.0000 | 179.7686 | 179.7686 | 3.4500e-003 | 3.3000e-003 | 180.8369 |
| Landscaping | 0.9974 | 0.3842 | 33.3312 | 1.7600e-003 | | 0.1853 | 0.1853 | | 0.1853 | 0.1853 | 0.0000 | 54.5922 | 54.5922 | 0.0520 | 0.0000 | 55.8930 |
| **Total** | **18.4555** | **0.5395** | **33.3972** | **2.7500e-003** | | **0.1979** | **0.1979** | | **0.1979** | **0.1979** | **0.0000** | **234.3608** | **234.3608** | **0.0555** | **3.3000e-003** | **236.7299** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 505.8250 | 0.3988 | 0.2390 | 587.0292 |
| Unmitigated | 505.8250 | 0.3988 | 0.2390 | 587.0292 |

### 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Apartments Mid Rise | 293.193 / 184.839 | 488.6933 | 0.3864 | 0.2317 | 567.3889 |
| Elementary School | 1.45454 / 3.74026 | 4.1276 | 2.0500e-003 | 1.1800e-003 | 4.5293 |
| Strip Mall | 7.85169 / 4.81232 | 13.0041 | 0.0103 | 6.2000e-003 | 15.1110 |
| **Total** | | **505.8250** | **0.3988** | **0.2390** | **587.0292** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Apartments Mid Rise | 293.193 / 184.839 | 488.6933 | 0.3864 | 0.2317 | 567.3889 |
| Elementary School | 1.45454 / 3.74026 | 4.1276 | 2.0500e-003 | 1.1800e-003 | 4.5293 |
| Strip Mall | 7.85169 / 4.81232 | 13.0041 | 0.0103 | 6.2000e-003 | 15.1110 |
| **Total** | | **505.8250** | **0.3988** | **0.2390** | **587.0292** |

## 8.0 Waste Detail

## 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 465.0117 | 27.4814 | 0.0000 | 1,152.0468 |
| Unmitigated | 465.0117 | 27.4814 | 0.0000 | 1,152.0468 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Apartments Mid Rise | 2070 | 420.1913 | 24.8326 | 0.0000 | 1,041.0061 |
| Elementary School | 109.5 | 22.2275 | 1.3136 | 0.0000 | 55.0677 |
| Strip Mall | 111.3 | 22.5929 | 1.3352 | 0.0000 | 55.9729 |
| **Total** | | **465.0117** | **27.4814** | **0.0000** | **1,152.0468** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Apartments Mid Rise | 2070 | 420.1913 | 24.8326 | 0.0000 | 1,041.0061 |
| Elementary School | 109.5 | 22.2275 | 1.3136 | 0.0000 | 55.0677 |
| Strip Mall | 111.3 | 22.5929 | 1.3352 | 0.0000 | 55.9729 |
| **Total** | | **465.0117** | **27.4814** | **0.0000** | **1,152.0468** |

# 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

# 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
| --- | --- |

## 11.0 Vegetation

## E. Tasman Plan Area

Trip and VMT Estimates

| Land Use | Size | Size Metric | Default | Daily Trip Rate: Weekday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| Apartments Mid Rise | 4500 | Dwelling Unit | 6.65 | 4.63 | 4.45 | 4.08 |
| Elementary School | 600 | Student | 1.05 | 1.05 | 0.00 | 0.00 |
| Strip Mall | 106 | 1000sqft | 44.32 | 50.66 | 48.05 | 23.35 |

| Land Use | Trip Length by Purpose (mi): Res H-W | Res H-S | Res H-O | NR C-C | NR C-C | NR C-NW |
|---|---|---|---|---|---|---|
| Apartments Mid Rise | 5.265 | 5.265 | 5.265 | 0 | 0 | 0 |
| Elementary School | 0 | 0 | 0 | 7.3 | 9.5 | 7.3 |
| Strip Mall | 0 | 0 | 0 | 2.3305 | 2.3305 | 2.3305 |

| Land Use | Trip Type (%): Primary | Diverted | Passby | Trip Purpose (%): Res H-W | Res H-S | Res H-O | NR C-C | NR C-C | NR C-NW |
|---|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 100% | 0% | 0% | 31% | 15% | 54% | 0% | 0% | 0% |
| Elementary School | 100% | 0% | 0% | 0% | 0% | 0% | 30% | 65% | 5% |
| Strip Mall | 100% | 0% | 0% | 0% | 0% | 0% | 64% | 17% | 19% |

| Daily Trips | Total Daily Trips | | | Primary Trips | | | Diverted Trips (25% of Primary) | | | Passby Trips (0.1mi) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 20,835 | 20,020 | 18,360 | 20,835 | 20,020 | 18,360 | - | - | - | - | - | - |
| Elementary School | 630 | - | - | 630 | - | - | - | - | - | - | - | - |
| Strip Mall | 5,370 | 5,094 | 2,475 | 5,370 | 5,094 | 2,475 | - | - | - | - | - | - |

| Daily VMT | Total VMT | | | Primary | | | Diverted (25% of Primary) | | | Passby (0.1mi) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Mid Rise | 109,696 | 105,407 | 96,665 | 109,696 | 105,407 | 96,665 | - | - | - | - | - | - |
| Elementary School | 5,500 | - | - | 5,500 | - | - | - | - | - | - | - | - |
| Strip Mall | 12,515 | 11,871 | 5,769 | 12,515 | 11,871 | 5,769 | - | - | - | - | - | - |

| | | | |
|---|---|---|---|
| Daily Weekday Trips | 26,835 | | |
| Annual Trips | 9,392,187 | | |
| Daily Weekday VMT: | 127,711 | | |
| Annual VMT | 44,752,449 | avg trip length | 4.76 |
| CalEEMod | | | |

# E Tasman

## Santa Clara County, Annual

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Light Industry | 708.00 | 1000sqft | 16.25 | 708,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 58 |
| **Climate Zone** | 4 | | | **Operational Year** | 2018 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 547 | **CH4 Intensity (lb/MWhr)** | 0.029 | **N2O Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - SVP Current Rate

Land Use - Existing uses w/o parking lots and default acreage

Construction Phase - Just operational

Off-road Equipment - Just operational

Trips and VMT - Just operational

Vehicle Trips - From TIA with traffic adjustments 4145 daily (weekday)/708 ksf = 5.85 -> 5.85,1.11,0.57 VMT = 21,625 or 5.22 mi/trip No passby/diverted

Energy Use - Historical data

Water And Wastewater - All WTP treatment

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| tblConstructionPhase | NumDays | 10.00 | 1.00 |
| tblConstructionPhase | PhaseEndDate | 5/25/2018 | 5/14/2018 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 0.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 547 |
| tblVehicleTrips | CC_TL | 7.30 | 5.22 |
| tblVehicleTrips | CNW_TL | 7.30 | 5.22 |
| tblVehicleTrips | CW_TL | 9.50 | 5.22 |
| tblVehicleTrips | DV_TP | 5.00 | 0.00 |
| tblVehicleTrips | PB_TP | 3.00 | 0.00 |
| tblVehicleTrips | PR_TP | 92.00 | 100.00 |
| tblVehicleTrips | ST_TR | 1.32 | 1.11 |
| tblVehicleTrips | SU_TR | 0.68 | 0.57 |
| tblVehicleTrips | WD_TR | 6.97 | 5.85 |
| tblWater | AerobicPercent | 87.46 | 100.00 |
| tblWater | AnaerobicandFacultativeLagoonsPercent | 2.21 | 0.00 |
| tblWater | SepticTankPercent | 10.33 | 0.00 |

## 2.0 Emissions Summary

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 3.1349 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Energy | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 2,761.6362 | 2,761.6362 | 0.1090 | 0.0384 | 2,775.8136 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile | 0.9691 | 3.6772 | 10.5333 | 0.0273 | 2.2109 | 0.0330 | 2.2439 | 0.5920 | 0.0311 | 0.6231 | 0.0000 | 2,487.1562 | 2,487.1562 | 0.1052 | 0.0000 | 2,489.7854 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 178.2098 | 0.0000 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 57.9262 | 219.8091 | 277.7352 | 0.2110 | 0.1284 | 321.2687 |
| **Total** | **4.2157** | **4.6925** | **11.3926** | **0.0334** | **2.2109** | **0.1102** | **2.3211** | **0.5920** | **0.1083** | **0.7002** | **236.1360** | **5,468.6141** | **5,704.7501** | **10.9571** | **0.1668** | **6,028.3886** |

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 3.1349 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Energy | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 2,761.6362 | 2,761.6362 | 0.1090 | 0.0384 | 2,775.8136 |
| Mobile | 0.9691 | 3.6772 | 10.5333 | 0.0273 | 2.2109 | 0.0330 | 2.2439 | 0.5920 | 0.0311 | 0.6231 | 0.0000 | 2,487.1562 | 2,487.1562 | 0.1052 | 0.0000 | 2,489.7854 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 178.2098 | 0.0000 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 57.9262 | 219.8091 | 277.7352 | 0.2110 | 0.1284 | 321.2687 |
| **Total** | **4.2157** | **4.6925** | **11.3926** | **0.0334** | **2.2109** | **0.1102** | **2.3211** | **0.5920** | **0.1083** | **0.7002** | **236.1360** | **5,468.6141** | **5,704.7501** | **10.9571** | **0.1668** | **6,028.3886** |

| | **ROG** | **NOx** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **Bio- CO2** | **NBio-CO2** | **Total CO2** | **CH4** | **N20** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.9691 | 3.6772 | 10.5333 | 0.0273 | 2.2109 | 0.0330 | 2.2439 | 0.5920 | 0.0311 | 0.6231 | 0.0000 | 2,487.1562 | 2,487.1562 | 0.1052 | 0.0000 | 2,489.7854 |
| Unmitigated | 0.9691 | 3.6772 | 10.5333 | 0.0273 | 2.2109 | 0.0330 | 2.2439 | 0.5920 | 0.0311 | 0.6231 | 0.0000 | 2,487.1562 | 2,487.1562 | 0.1052 | 0.0000 | 2,489.7854 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Light Industry | 4,141.80 | 785.88 | 403.56 | 5,944,113 | 5,944,113 |
| Total | 4,141.80 | 785.88 | 403.56 | 5,944,113 | 5,944,113 |

### 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Light Industry | 5.22 | 5.22 | 5.22 | 59.00 | 28.00 | 13.00 | 100 | 0 | 0 |

### 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 0.596719 | 0.040200 | 0.188056 | 0.111125 | 0.016796 | 0.004948 | 0.012194 | 0.019466 | 0.002007 | 0.001626 | 0.005410 | 0.000612 | 0.000841 |

## 5.0 Energy Detail

Historical Energy Use: Y

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,656.5251 | 1,656.5251 | 0.0878 | 0.0182 | 1,664.1354 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,656.5251 | 1,656.5251 | 0.0878 | 0.0182 | 1,664.1354 |
| NaturalGas Mitigated | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| NaturalGas Unmitigated | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Light Industry | 2.0709e+007 | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| **Total** | | **0.1117** | **1.0152** | **0.8527** | **6.0900e-003** | | **0.0772** | **0.0772** | | **0.0772** | **0.0772** | **0.0000** | **1,105.1111** | **1,105.1111** | **0.0212** | **0.0203** | **1,111.6782** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 2.0709e+007 | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| **Total** | | **0.1117** | **1.0152** | **0.8527** | **6.0900e-003** | | **0.0772** | **0.0772** | | **0.0772** | **0.0772** | **0.0000** | **1,105.1111** | **1,105.1111** | **0.0212** | **0.0203** | **1,111.6782** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Light Industry | 6.67644e+006 | 1,656.5251 | 0.0878 | 0.0182 | 1,664.1354 |
| **Total** | | **1,656.5251** | **0.0878** | **0.0182** | **1,664.1354** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Light Industry | 6.67644e+006 | 1,656.5251 | 0.0878 | 0.0182 | 1,664.1354 |
| **Total** | | **1,656.5251** | **0.0878** | **0.0182** | **1,664.1354** |

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 3.1349 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Unmitigated | 3.1349 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |

### 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.3692 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 2.7651 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 6.3000e-004 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| **Total** | **3.1349** | **6.0000e-005** | **6.6000e-003** | **0.0000** | | **2.0000e-005** | **2.0000e-005** | | **2.0000e-005** | **2.0000e-005** | **0.0000** | **0.0127** | **0.0127** | **3.0000e-005** | **0.0000** | **0.0135** |

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.3692 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 2.7651 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 6.3000e-004 | 6.0000e-005 | 6.6000e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| **Total** | **3.1349** | **6.0000e-005** | **6.6000e-003** | **0.0000** | | **2.0000e-005** | **2.0000e-005** | | **2.0000e-005** | **2.0000e-005** | **0.0000** | **0.0127** | **0.0127** | **3.0000e-005** | **0.0000** | **0.0135** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 277.7352 | 0.2110 | 0.1284 | 321.2687 |
| Unmitigated | 277.7352 | 0.2110 | 0.1284 | 321.2687 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Light Industry | 163.725 / 0 | 277.7352 | 0.2110 | 0.1284 | 321.2687 |
| **Total** | | **277.7352** | **0.2110** | **0.1284** | **321.2687** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Light Industry | 163.725 / 0 | 277.7352 | 0.2110 | 0.1284 | 321.2687 |
| **Total** | | **277.7352** | **0.2110** | **0.1284** | **321.2687** |

# 8.0 Waste Detail

## 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |

| | | | | |
|---|---|---|---|---|
| Mitigated | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Unmitigated | 178.2098 | 10.5319 | 0.0000 | 441.5073 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Light Industry | 877.92 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| **Total** | | **178.2098** | **10.5319** | **0.0000** | **441.5073** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Light Industry | 877.92 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| **Total** | | **178.2098** | **10.5319** | **0.0000** | **441.5073** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

# E Tasman

## Santa Clara County, Annual

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Light Industry | 708.00 | 1000sqft | 16.25 | 708,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 58 |
| **Climate Zone** | 4 | | | **Operational Year** | 2030 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 380 | **CH4 Intensity (lb/MWhr)** | 0.029 | **N2O Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - SVP Post-2020 Rate

Land Use - Existing uses w/o parking lots and default acreage

Construction Phase - Just operational

Off-road Equipment - Just operational

Trips and VMT - Just operational

Vehicle Trips - From TIA with traffic adjustments 4145 daily (weekday)/708 ksf = 5.85 -> 5.85,1.11,0.57 VMT = 21,625 or 5.22 mi/trip No passby/diverted

Energy Use - Historical data

Water And Wastewater - All WTP treatment

Consumer Products - Adjusted consumer product rate

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstructionPhase | NumDays | 10.00 | 1.00 |
| tblConstructionPhase | PhaseEndDate | 5/25/2018 | 5/14/2018 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 1.67E-05 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 0.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 380 |
| tblVehicleTrips | CC_TL | 7.30 | 5.22 |
| tblVehicleTrips | CNW_TL | 7.30 | 5.22 |
| tblVehicleTrips | CW_TL | 9.50 | 5.22 |
| tblVehicleTrips | DV_TP | 5.00 | 0.00 |
| tblVehicleTrips | PB_TP | 3.00 | 0.00 |
| tblVehicleTrips | PR_TP | 92.00 | 100.00 |
| tblVehicleTrips | ST_TR | 1.32 | 1.11 |
| tblVehicleTrips | SU_TR | 0.68 | 0.57 |
| tblVehicleTrips | WD_TR | 6.97 | 5.85 |
| tblWater | AerobicPercent | 87.46 | 100.00 |
| tblWater | AnaerobicandFacultativeLagoonsPercent | 2.21 | 0.00 |
| tblWater | SepticTankPercent | 10.33 | 0.00 |

## 2.0 Emissions Summary

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 2.5276 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Energy | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 2,255.8964 | 2,255.8964 | 0.1090 | 0.0384 | 2,270.0738 |
| Mobile | 0.4379 | 1.8720 | 4.6627 | 0.0194 | 2.2098 | 0.0132 | 2.2231 | 0.5914 | 0.0123 | 0.6037 | 0.0000 | 1,786.7134 | 1,786.7134 | 0.0531 | 0.0000 | 1,788.0409 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 178.2098 | 0.0000 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 57.9262 | 152.7010 | 210.6272 | 0.2110 | 0.1284 | 254.1606 |
| **Total** | **3.0772** | **2.8872** | **5.5219** | **0.0255** | **2.2098** | **0.0904** | **2.3002** | **0.5914** | **0.0895** | **0.6809** | **236.1360** | **4,195.3235** | **4,431.4594** | **10.9051** | **0.1668** | **4,753.7960** |

## Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 2.5276 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Energy | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 2,255.8964 | 2,255.8964 | 0.1090 | 0.0384 | 2,270.0738 |
| Mobile | 0.4379 | 1.8720 | 4.6627 | 0.0194 | 2.2098 | 0.0132 | 2.2231 | 0.5914 | 0.0123 | 0.6037 | 0.0000 | 1,786.7134 | 1,786.7134 | 0.0531 | 0.0000 | 1,788.0409 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 178.2098 | 0.0000 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 57.9262 | 152.7010 | 210.6272 | 0.2110 | 0.1284 | 254.1606 |
| **Total** | **3.0772** | **2.8872** | **5.5219** | **0.0255** | **2.2098** | **0.0904** | **2.3002** | **0.5914** | **0.0895** | **0.6809** | **236.1360** | **4,195.3235** | **4,431.4594** | **10.9051** | **0.1668** | **4,753.7960** |

| | **ROG** | **NOx** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **Bio- CO2** | **NBio-CO2** | **Total CO2** | **CH4** | **N20** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.4379 | 1.8720 | 4.6627 | 0.0194 | 2.2098 | 0.0132 | 2.2231 | 0.5914 | 0.0123 | 0.6037 | 0.0000 | 1,786.7134 | 1,786.7134 | 0.0531 | 0.0000 | 1,788.0409 |
| Unmitigated | 0.4379 | 1.8720 | 4.6627 | 0.0194 | 2.2098 | 0.0132 | 2.2231 | 0.5914 | 0.0123 | 0.6037 | 0.0000 | 1,786.7134 | 1,786.7134 | 0.0531 | 0.0000 | 1,788.0409 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Light Industry | 4,141.80 | 785.88 | 403.56 | 5,944,113 | 5,944,113 |
| Total | 4,141.80 | 785.88 | 403.56 | 5,944,113 | 5,944,113 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Light Industry | 5.22 | 5.22 | 5.22 | 59.00 | 28.00 | 13.00 | 100 | 0 | 0 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 0.621541 | 0.034056 | 0.180136 | 0.101248 | 0.011859 | 0.005060 | 0.013110 | 0.022881 | 0.002221 | 0.001470 | 0.005122 | 0.000646 | 0.000651 |

# 5.0 Energy Detail

Historical Energy Use: Y

## 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,150.7853 | 1,150.7853 | 0.0878 | 0.0182 | 1,158.3956 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,150.7853 | 1,150.7853 | 0.0878 | 0.0182 | 1,158.3956 |
| NaturalGas Mitigated | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| NaturalGas Unmitigated | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Light Industry | 2.0709e+007 | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| **Total** | | **0.1117** | **1.0152** | **0.8527** | **6.0900e-003** | | **0.0772** | **0.0772** | | **0.0772** | **0.0772** | **0.0000** | **1,105.1111** | **1,105.1111** | **0.0212** | **0.0203** | **1,111.6782** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Light Industry | 2.0709e+007 | 0.1117 | 1.0152 | 0.8527 | 6.0900e-003 | | 0.0772 | 0.0772 | | 0.0772 | 0.0772 | 0.0000 | 1,105.1111 | 1,105.1111 | 0.0212 | 0.0203 | 1,111.6782 |
| **Total** | | **0.1117** | **1.0152** | **0.8527** | **6.0900e-003** | | **0.0772** | **0.0772** | | **0.0772** | **0.0772** | **0.0000** | **1,105.1111** | **1,105.1111** | **0.0212** | **0.0203** | **1,111.6782** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Light Industry | 6.67644e+006 | 1,150.7853 | 0.0878 | 0.0182 | 1,158.3956 |
| **Total** | | **1,150.7853** | **0.0878** | **0.0182** | **1,158.3956** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Light Industry | 6.67644e+006 | 1,150.7853 | 0.0878 | 0.0182 | 1,158.3956 |
| **Total** | | **1,150.7853** | **0.0878** | **0.0182** | **1,158.3956** |

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 2.5276 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| Unmitigated | 2.5276 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |

### 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.3692 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 2.1578 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 5.9000e-004 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| **Total** | **2.5276** | **6.0000e-005** | **6.4700e-003** | **0.0000** | | **2.0000e-005** | **2.0000e-005** | | **2.0000e-005** | **2.0000e-005** | **0.0000** | **0.0127** | **0.0127** | **3.0000e-005** | **0.0000** | **0.0135** |

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.3692 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 2.1578 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 5.9000e-004 | 6.0000e-005 | 6.4700e-003 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | 0.0000 | 0.0127 | 0.0127 | 3.0000e-005 | 0.0000 | 0.0135 |
| **Total** | **2.5276** | **6.0000e-005** | **6.4700e-003** | **0.0000** | | **2.0000e-005** | **2.0000e-005** | | **2.0000e-005** | **2.0000e-005** | **0.0000** | **0.0127** | **0.0127** | **3.0000e-005** | **0.0000** | **0.0135** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 210.6272 | 0.2110 | 0.1284 | 254.1606 |
| Unmitigated | 210.6272 | 0.2110 | 0.1284 | 254.1606 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Light Industry | 163.725 / 0 | 210.6272 | 0.2110 | 0.1284 | 254.1606 |
| **Total** | | **210.6272** | **0.2110** | **0.1284** | **254.1606** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Light Industry | 163.725 / 0 | 210.6272 | 0.2110 | 0.1284 | 254.1606 |
| **Total** | | **210.6272** | **0.2110** | **0.1284** | **254.1606** |

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| Unmitigated | 178.2098 | 10.5319 | 0.0000 | 441.5073 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Light Industry | 877.92 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| **Total** | | **178.2098** | **10.5319** | **0.0000** | **441.5073** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Light Industry | 877.92 | 178.2098 | 10.5319 | 0.0000 | 441.5073 |
| **Total** | | **178.2098** | **10.5319** | **0.0000** | **441.5073** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

## Attachment 2:  Community Risk Assessment Information

Bay Area Air Quality Management District

# Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

**INSTRUCTIONS:**

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

**Search Parameters**

| | | |
|---|---|---|
| County | Santa Clara | |
| Roadway Direction | North-South | |
| Side of the Roadway | East | |
| Distance from Roadway | 100 | feet |
| Annual Average Daily Traffic (ADT) | 30,000 | |

**Results**

<u>Santa Clara County</u>

**NORTH-SOUTH DIRECTIONAL ROADWAY**

**PM2.5 annual average**

0.315 ($\mu g/m^3$)

**Cancer Risk**

13.43 (per million)

**Lafayette**

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

**Adjusted for 2015 OEHHA and EMFAC2014 for 2018**

**9.23**

**(per million)**

**Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area**

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

# Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

**INSTRUCTIONS:**

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

**Search Parameters**

| | | |
|---|---|---|
| County | Santa Clara | |
| Roadway Direction | East-West | |
| Side of the Roadway | North | |
| Distance from Roadway | 25 | feet |
| Annual Average Daily Traffic (ADT) | 45,000 | |

**Results**

Santa Clara County

**EAST-WEST DIRECTIONAL ROADWAY**

**PM2.5 annual average**

0.418 ($\mu g/m^3$)

**Cancer Risk**

20.94 (per million)

**Tasman**

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

**Adjusted for 2015 OEHHA and EMFAC2014 for 2018**

**14.39**

**(per million)**

**Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area**

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

# Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

**INSTRUCTIONS:**

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

**Search Parameters**

| | | |
|---|---|---|
| County | Santa Clara | |
| Roadway Direction | East-West | |
| Side of the Roadway | North | |
| Distance from Roadway | 110 | feet |
| Annual Average Daily Traffic (ADT) | 45,000 | |

**Results**

Santa Clara County

**EAST-WEST DIRECTIONAL ROADWAY**

**PM2.5 annual average**

0.279 (µg/m$^3$)

**Cancer Risk**

14.22 (per million)

**Tasman**

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

**Adjusted for 2015 OEHHA and EMFAC2014 for 2018**

**9.77**

**(per million)**

**Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area**

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

# Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

**INSTRUCTIONS:**

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

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• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

**Search Parameters**

| | | |
|---|---|---|
| County | Santa Clara | |
| Roadway Direction | North-South | |
| Side of the Roadway | West | |
| Distance from Roadway | 150 | feet |
| Annual Average Daily Traffic (ADT) | 15,000 | |

**Results**

## Santa Clara County

**NORTH-SOUTH DIRECTIONAL ROADWAY**

**PM2.5 annual average**

0.071 (µg/m$^3$)

**Cancer Risk**

3.54 (per million)

**Lick Mill**

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

**Adjusted for 2015 OEHHA and EMFAC2014 for 2018**

**2.43**

**(per million)**

**Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area**

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

## Bay Area Air Quality Management District

## Risk & Hazard Stationary Source Inquiry Form

**This form is required when users request stationary source data from BAAQMD. This for**

For guidance on conducting a risk & hazard screening, including for roadways & freeways

| Table A: Requestor Contact Information | |
|---|---|
| **Contact Name:** | James Reyff |
| **Affiliation:** | Illingworth & Rodkin, Inc. |
| **Phone:** | 707-794-0400 |
| **Email:** | |
| **Date of Request** | |
| **Project Name:** | E. Tasman Specific Plan |
| **Address:** | |
| **City:** | Santa Clara |
| **County:** | Santa Clara |
| **Type (residential, commercial, mixed use, industrial, etc.):** | Residential/Commercial |
| **Project size (# of units, or building square feet):** | mixed |
| | |
| **Comments:** | |
| Used 2012 data and applied 2015 OEHHA and distance multipliers | |

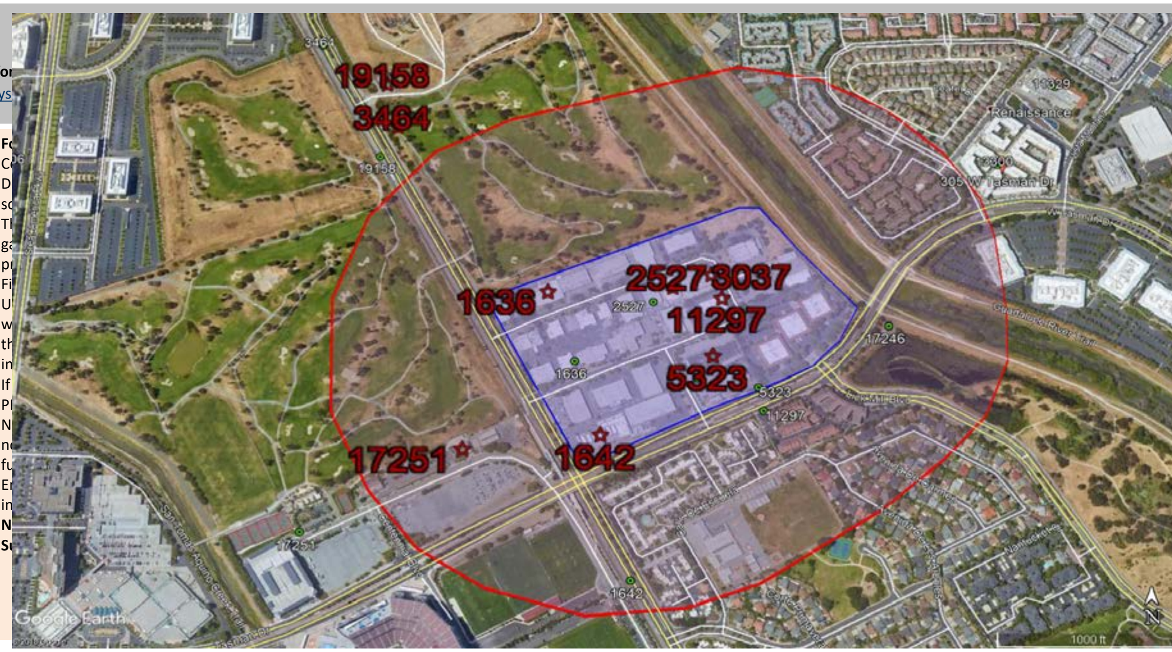


**Table B: Stationary Sources within 1,000 feet of Receptor that say "Contact District Staff"**

| Distance from Receptor (feet) | Plant # or Gas Dispensary # | Facility Name | Street Address | 2012 Screening Level Cancer Risk (1) | 2012 Screening Level Hazard Index (1) | 2012 Screening Level PM2.5 (1) | 2015 Screening Level Cancer Risk (w/OEHHA) | Multiplier | Distance Adjusted Cancer Risk | Distance Adjusted PM2.5 Level | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Table B Section 1: Requestor fills out these columns based on Google Earth data** | | | | **Table B Section 2: BAAQMD returns form with additional information in these columns as needed** | | | | | | | |
| onsite | 5323 | Coatek, Inc | 2272 CALLE DE LUNA | 0.41 | 0.001 | 4.390 | 0.56 | 1.00 | 0.56 | 4.39 | Plant Closed |
| onsite | 1636 | Alzeta Corporation | 2343 CALLE DEL MUNDO | 0 | 0.000 | 0.037 | 0.00 | 1 | 0.00 | 0.04 | |
| onsite | 2527 | Nu-Metal Finishing | 2262 CALLE DEL MUNDO | 0 | 0.000 | 0.001 | 0.00 | 1.00 | 0.00 | 0.00 | |
| onsite | 3037 | Italix Company, Incorporated | 2232 CALLE DEL MUNDO | 0 | 0.005 | 0.066 | 0.00 | 1 | 0.00 | 0.07 | |
| onsite | 11297 | Shibaura Technology International Corp | 2221 CALLE DE LUNA | 0 | 0.000 | 0.000 | 0.00 | 1 | 0.00 | 0.00 | |
| onsite | 1642 | Megastor | 5101 LAFAYETTE STREET | 0 | 0.000 | 0.013 | 0.00 | 1 | 0.00 | 0.01 | |
| 500 | 17251 | City of Santa Clara | 2501 STARS & STRIPES | 43.88 | 0.016 | 0.078 | 60.31 | 0.12 | 7.24 | 0.01 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Footnotes:

1. These Cancer Risk, Hazard Index, and PM2.5 columns represent the rows in the Google Earth Plant Information Table that say "Contact District Staff" (Map A above). BAAQMD will return this form to you with this screening level information entered in these columns.

Date last updated:
3/12/12

**Tasman, Santa Clara, CA**
**DPM Modeling - Rail Line Information and DPM and PM2.5 Emission Rates**
**Caltrain Without Electrification - Diesel-Powered Passenger and Freight Trains**

| | | | | | | | | | | | DPM Emission Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Description** | **Model No. Lines** | **Link Width (ft)** | **Link Width (m)** | **Link Length (ft)** | **Link Length (miles)** | **Link Length (m)** | **Release Height (m)** | **No. Trains per Day** | **Train Travel Speed (mph)** | **Average Daily Emission Rate (g/mi/day)** | **Average Daily Emission Rate (g/day)** | **Link Emission Rate (g/s)** | **Link Emission Rate (lb/hr)** |
| **2020** | Commuter Trains - North of Station | 1 | 12 | 3.7 | 1,721 | 0.33 | 524 | 5.0 | 20 | 30 | 75.1 | 24.5 | 2.83E-04 | 2.25E-03 |
| | Commuter Trains - at/near Station | 1 | 12 | 3.7 | 1,042 | 0.20 | 317 | 5.0 | 20 | 10 | 45.0 | 8.9 | 1.03E-04 | 8.16E-04 |
| | Commuter Trains - South of Station | 1 | 12 | 3.7 | 576 | 0.11 | 175 | 5.0 | 20 | 30 | 75.1 | 8.2 | 9.47E-05 | 7.52E-04 |
| | Amtrak - bypass Station | 1 | 12 | 3.7 | 3,338 | 0.63 | 1,017 | 5.0 | 2 | 40 | 5.7 | 3.6 | 4.18E-05 | 3.32E-04 |
| | Freight Trains - bypass Station | 1 | 12 | 3.7 | 3,338 | 0.63 | 1,017 | 5.0 | 2 | 40 | 10.7 | 6.8 | 7.82E-05 | 6.20E-04 |
| | **Total** | - | - | - | - | - | - | - | **63** | - | **211.5** | **51.9** | **6.01E-04** | **4.77E-03** |

Notes: Emission based on Emission Factors for Locomotives, USEPA 2009 (EPA-420-F-09-025)
Average emissions calculated for 2020 and periods 2021-2025, 2026-2049.
Fuel correction factors from Offroad Modeling Change Technical memo, Changes to the Locomotive Inventory, CARB July 2006.
PM2.5 calculated as 92% of PM emissions (CARB CEIDERS PM2.5 fractions)
Passenger trains assumed to operate for 24 hours per day
Freight trains assumed to operate for 24 hours per day

| ***Commuter Trains that Stop at Station (ACE and Capitol Corridor)*** | | | |
|---|---|---|---|
| | **2020** | | |
| Arrive/Depart Station | ***At/Near Station*** | ***Away From Station*** | ***Total*** |
| Passenger trains - weekday | 22 | 22 | 22 |
| Passenger trains - weekend | 14 | 14 | 14 |
| Passenger trains - Sat only | 0 | 0 | 0 |
| Total Trains | 36 | 36 | 36 |
| Annual average daily trains | 20 | 20 | 20 |
| Locomotive horsepower | 3200 | 3200 | 3200 |
| Locomotive engine load = | 0.1 | 0.5 | |
| ***Commuter Trains that Bypass Station (Amtrak Coast Starlight)*** | | | |
| Arrive/Depart Station | ***At/Near Station*** | ***Away From Station*** | ***Total*** |
| Passenger trains - weekday = | 0 | 2 | 2 |
| Passenger trains - weekend = | 0 | 2 | 2 |
| Passenger trains - Sat only = | 0 | 0 | 0 |
| Total Trains = | 0 | 4 | 4 |
| Annual average daily trains = | 0 | 2 | 2 |
| Locomotive horsepower = | 3200 | 3200 | 3200 |
| Locomotive engine load = | 0.1 | 0.5 | |
| ***Freight Trains - All Diesel & Bypass Station*** | | | |
| Freight trains per day | | 2 | |
| Locomotive horsepower | | 2300 | |
| Locomotives per train | | 2 | |
| Total horsepower | | 4600 | |
| Locomotive engine load | | 0.5 | |

**Locomotive DPM Emission Factors (g/hp-hr)**

| **Train Type** | **2020** |
|---|---|
| Passenger | 0.101 |
| Freight | 0.111 |

* average emissions for period.

| | | |
|---|---|---|
| PM2.5 to PM ratio = | 0.92 | |
| DPM to PM ratio = | 1 | |
| | CARB Fuel Adj Factor | |
| | 2010 | 2011+ |
| Passenger | 0.717 | 0.709 |
| Freight | 0.851 | 0.840 |

**Tasman Santa Clara -Rail Line DPM & PM2.5 Concentrations**
**AERMOD Risk Modeling Parameters and Maximum Concentrations**
**Diesel-Powered Passenger and Freight Trains**

**Receptor Information**

| | |
|---|---|
| Number of Receptors | 821 |
| Receptor Height = | 1.5 meters |
| Receptor distances = | 15 meter grid in project site |

**Meteorological Conditions**

| | |
|---|---|
| BAAQMD - San Jose Airport Hourly | 2006-2010 |
| Land Use Classification | urban |
| Wind speed = | variable |
| Wind direction = | variable |

**Construction MEI Maximum Concentrations**

| Meteorological Data Years | Average DPM Concentration ($\mu g/m^3$) 2020 |
|---|---|
| 1999-2000 | 0.0296 |
| **Meteorological Data Years** | **Average PM2.5 Concentration ($\mu g/m^3$) 2020** |
| 1999-2000 | 0.0272 |

**Tasman Santa Clara - Construction Maximum Impact Receptor**
**AERMOD Railroad DPM Risk Modeling Parameters and Maximum Cancer Risk**
**Diesel-Powered Passenger and Freight Trains**

**Cancer Risk Calculation Method**

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air}$ x DBR x A x (EF/365) x $10^{-6}$

Where: $C_{air}$ = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
$10^{-6}$ = Conversion factor

**Values**

**Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$**

| TAC | CPF |
|---|---|
| DPM | 1.10E+00 |

| | Infant/Child | | | Adult |
|---|---|---|---|---|
| Age --> Parameter | 3rd Trimester | 0 - <2 | 2 - <16 | 16 - 30 |
| ASF | 10 | 10 | 3 | 1 |
| DBR* = | 361 | 1090 | 572 | 261 |
| A = | 1 | 1 | 1 | 1 |
| EF = | 350 | 350 | 350 | 350 |
| ED = | 0.25 | 2 | 14 | 14 |
| AT = | 70 | 70 | 70 | 70 |
| FAH = | 1.00 | 1.00 | 1.00 | 0.73 |

* 95th percentile breathing rates for infants and 80th percentile for children and adults

**Rail Locomotive Cancer Risk by Year - Maximum Impact Receptor Location**

| Exposure Year | Year | Exposure Duration (years) | Age | Age Sensitivity Factor | DPM Annual Conc (ug/m3) | DPM Cancer Risk (per million) |
|---|---|---|---|---|---|---|
| 0 | 2020 | 0.25 | -0.25 - 0* | 10 | 0.0296 | 0.402 |
| 1 | 2020 | 1 | 1 | 10 | 0.0296 | 4.853 |
| 2 | 2021 | 1 | 2 | 10 | 0.0296 | 4.853 |
| 3 | 2022 | 1 | 3 | 3 | 0.0296 | 0.764 |
| 4 | 2023 | 1 | 4 | 3 | 0.0296 | 0.764 |
| 5 | 2024 | 1 | 5 | 3 | 0.0296 | 0.764 |
| 6 | 2025 | 1 | 6 | 3 | 0.0296 | 0.764 |
| 7 | 2026 | 1 | 7 | 3 | 0.0296 | 0.764 |
| 8 | 2027 | 1 | 8 | 3 | 0.0296 | 0.764 |
| 9 | 2028 | 1 | 9 | 3 | 0.0296 | 0.764 |
| 10 | 2029 | 1 | 10 | 3 | 0.0296 | 0.764 |
| 11 | 2030 | 1 | 11 | 3 | 0.0296 | 0.764 |
| 12 | 2031 | 1 | 12 | 3 | 0.0296 | 0.764 |
| 13 | 2032 | 1 | 13 | 3 | 0.0296 | 0.764 |
| 14 | 2033 | 1 | 14 | 3 | 0.0296 | 0.764 |
| 15 | 2034 | 1 | 15 | 3 | 0.0296 | 0.764 |
| 16 | 2035 | 1 | 16 | 3 | 0.0296 | 0.764 |
| 17 | 2036 | 1 | 17 | 1 | 0.0296 | 0.085 |
| 18 | 2037 | 1 | 18 | 1 | 0.0296 | 0.085 |
| 19 | 2038 | 1 | 19 | 1 | 0.0296 | 0.085 |
| 20 | 2039 | 1 | 20 | 1 | 0.0296 | 0.085 |
| 21 | 2040 | 1 | 21 | 1 | 0.0296 | 0.085 |
| 22 | 2041 | 1 | 22 | 1 | 0.0296 | 0.085 |
| 23 | 2042 | 1 | 23 | 1 | 0.0296 | 0.085 |
| 24 | 2043 | 1 | 24 | 1 | 0.0296 | 0.085 |
| 25 | 2044 | 1 | 25 | 1 | 0.0296 | 0.085 |
| 26 | 2045 | 1 | 26 | 1 | 0.0296 | 0.085 |
| 27 | 2046 | 1 | 27 | 1 | 0.0296 | 0.085 |
| 28 | 2047 | 1 | 28 | 1 | 0.0296 | 0.085 |
| 29 | 2048 | 1 | 29 | 1 | 0.0296 | 0.085 |
| 30 | 2049 | 1 | 30 | 1 | 0.0296 | 0.085 |
| **Total Increased Cancer Risk** | | | | | | **22.0** |

* Third trimester of pregnancy